THE IRON TRADE REVIEW

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FAVORABLE REPORTS

COME FROM ALL PARTS OF THE UNITED STATES THIS WEEK.

Mills Filled with Orders for Rails—American Bridge Co's. Unprecedented Business—Steel Bars Selling Freely.

Following the heavy sales of pig iron reported last week, favorable news comes from all parts of the country this week concerning not only pig iron, but also almost every kind of finished material, with exception of sheets, which are still weak. In some places improved labor conditions with freedom from strikes have added materially to prevailing prosperity. This is especially true in Colorado, where instead of the serious labor disturbances of last year, there is now industrial peace and great business activity. In some cities there are minor strikes, but as a rule, new construction is not being seriously interfered with.

Rail Orders Very Heavy.

Rail orders placed with mills this year now aggregate 1,700,000 tons, and inquiries for more than 500,000 tons are pending. Not only is the Steel Corporation well supplied with orders, but such concerns as the Republic Iron & Steel Co. and the Lackawanna Steel Co. have orders for all rails they can roll for many months. Officials of one company state that they could book orders for 300,000 tons for next year's delivery in a couple of days, if they were willing to sell that far ahead. Among the recent orders for rails are the following: Missouri Pacific, 22,000 tons; St. Louis & Southwestern, 6,000; Chesapeake & Ohio, 4,000; Toledo, Ann Arbor & Detroit, 4,000; Somerset Railway, 5,000; Central Railway of New Jersey, 3,500; Buffalo & Susquehanna, 3,500; Spokane International, 17,000; miscellaneous, 23,000; making 88,000 tons booked within a few days.

Billets in Strong Demand.

Buyers of billets, sheet and tin bars are now placing their orders for the last half of the year, and the orders taken by steel mills during the week are the heaviest in the past four months. Only a few producers are able to supply the finishing mills, and these few are holding Bessemer and basic billets firm at $23.00 and sheet bars, long lengths, are quoted at $25.00. The sheet and tin mills not controlling their own supply of steel are compelled to depend upon the leading interest, as it is the only producer whose books are not filled for the remainder of the year.

Contracts for Steel Bars.

The tonnage of unfilled orders now carried by the American Bridge Co. is higher than at any time in its history, having passed 500,000. As the monthly output of this company's plants does not exceed 60,000 tons, orders already on hand are enough to keep the plants busy through the first quarter of 1906. The Lackawanna and other companies also have many orders ahead, and it is extremely difficult to obtain promises for delivery of structural material. Within a few days there has been heavy buying of steel bars, especially in the Cleveland district, where the tonnage amounted to about 40,000. Agricultural interests are making contracts freely at 1.50c Pittsburg, and are showing considerable uneasiness concerning delivery. Bar iron is more active, the usual quotation being 1.50c to 1.60c at the mill, according to local conditions.

Pig Iron Is Firmer.

The buying of pig iron, while not as heavy in the past week as in the few days preceding, has been of good size, especially in the East. The pig iron market in Pittsburg has been less active than in most other centers. The present buying movement was started in the North by large selling interests. Thinking that the time had come when orders could be placed at figures somewhat below those commonly made, they granted some concessions and booked very large orders. They have not been disappointed as to the result on the market, for everywhere it is firmer and buyers are anxious to care for their requirements for the second half, while sellers are reluctant to sell except for prompt shipments. As we stated last week, the one danger is that prices will be advanced too rapidly. This tendency is already noticeable in the South, where large interests are asking $12.00 for No. 2 Birmingham, and buyers are showing some hesitancy. Northern irons are firmer, and $14.00 is now the minimum for No. 2 Foundry, but some furnaces are asking $14.50. Some producers of basic continue to pile their iron rather than sell at $14.00. The demand for Bessemer is slightly improved.

Strike is Expected.

(Special Telegram.)

Pittsburg, Pa., July 26.—The molders of the Pittsburg district after an unsuccessful effort to secure an agreement with the Manufacturers Association, of Pittsburg, for an increase in the minimum to $3.20 per day for the year ending July 1, 1906, or $3.30 per day without an agreement are now presenting their demands to the founders as individuals and are demanding that their demands be granted no later than Thursday of this week. Individual demands are being made to break the ranks of the manufacturers, if possible, but all the members of the association will refuse the increase. The indications favor a strike.

The semi-centennial celebration of the completion of the first canal at Sault Ste. Marie will be held on Wednesday and Thursday of next week. There will be an imposing procession of vessels, fire works, speechmaking and other features, and it is expected that there will be a very large crowd in attendance. On account of the celebration the Michigan Central Railroad Co. has made a rate of $11.15 for the round trip from Detroit to Sault Ste. Marie. Correspondingly low rates will be made from all points in Michigan. Tickets will be sold July 31 and Aug. 1, good for return until Aug. 5. The Michigan Central has through sleeping cars, leaving Detroit at 8:55 P. M. to the Sault and also direct connection at Mackinaw City with the Northern Peninsula Special, leaving Detroit at 7:05 A. M.

THE WEEK IN IRON CENTERS.

PITTSBURG.

Demand for Pig Iron Improved- Heavy Buying of Billets and Sheet Bars.

OFFICE OF *The Iron Trade Review*,
521 PARK BUILDING, July 26.

Demand for pig iron throughout this district has improved, but the buying has not been on nearly as large a scale as in other sections of the country. Several foundries have covered requirements through the remainder of the year, but the largest consumers have not sent out inquiries and none are expected in the near future as the tonnage closed early in the year will carry them well through the third quarter. Northern iron was advanced from 25 to 50 cents a ton during the week, largely in sympathy with the advance made by the Southern producers, most of them holding No. 2 at $12, Birmingham, although it is still possible to do as low as $11.50. There is little demand for steel making irons and the prices the furnacemen are asking do not meet the views of the few small consumers that are in the market for small tonnages for immediate use.

Consumers of billets, sheet and tin bars are now buying for last half delivery and the tonnage booked by the steel mills during the week is the heaviest in the past four months. Several steel works are turning away tonnage for delivery in the next six weeks and two months on account of the pressure on their finishing departments, and the few producers that are in position to supply the finishing mills are holding Bessemer and basic billets firm at $23, while sheet bars, long lengths, are quoted at $25 and cut bars at an advance of 25 cents a ton. Owing to the operation of the Ohio works of the Carnegie Steel Co., Youngstown, O., on rails for the remainder of the year, the production of sheet bars at the company's works during that period is reduced from 30,000 to 35,000 tons. The few independent sheet bar manufacturers have their books filled until the remainder of the year and the leading interest is the only source of supply now remaining for the sheet and tin mills not controlling their supply of steel.

The total rail tonnage placed with the mills this year now aggregates 1,700,000 tons and the indications are that the 2,000,000 mark will be passed before the end of August. A number of roads are endeavoring to place orders with the mills for early delivery, but nothing can be promised before September 1. The Republic Iron & Steel Co. already has orders on its books which will insure the full operation of its mill until that time and has been compelled to turn away business for earlier delivery.

The American Bridge Co. is now carrying a larger tonnage of unfilled orders on its books than at any time in its history. The previous high point was 400,000 tons, but the orders today have passed half million tons. As the output of the company's plants does not exceed 60,000 tons a month, the business booked insures full operation through the first quarter of 1906. Other structural fitting concerns in this district are likewise carrying a tremendous tonnage for future delivery and the structural mills are swamped with orders. Large mills in this district are not yet asking premiums, but are compelled to refuse considerable prompt tonnage. One small mill rolling light angles this week secured a premium of $3 for prompt shipment, and although the leading producers at their meeting last week decided to avoid asking premiums, there is little likelihood that they can prevent the advance of prices in this way.

Furnace coke is lower despite the slight advance in Northern foundry iron. One order for 20 cars daily during the next six weeks was placed at $1.75, but for delivery through the remainder of the second half $1.90 cannot be shaded. W. P. Snyder & Co. have again closed for the entire output of the Brown & Cochran coke plant in the Connellsville region, for 1906, amounting to 300,000 tons. Price will be adjusted from month to month on a sliding scale arrangement based on the price of Bessemer iron, Valley furnace.

Pig Iron.—The National Tube Co. and the Mesta Machine Co. figured as the largest buyers of iron in this market during the past week. The former closed for 2,500 tons of Southern forge, some of which was secured at $10, Birmingham, and the remainder at $10.50. The Mesta Machine Co. closed for 1,000 tons of Northern No. 2 at $14.75 delivered, and a like tonnage of forge at $14.35. This is for delivery the balance of the year. There have been numerous scattering sales of small lots for early delivery on the basis of $14.25 to $14.50 furnace for No. 2 and the same price has been ruling for basic and Bessemer. Southern producers pretty generally advanced No. 2 to $12 Birmingham last Thursday, but a few isolated furnaces are still willing to accept $11.50. This sudden advance has at least temporarily checked the buying of Southern iron in this market and is considered an unwise move by Northern operators. This week the furnaces of the Youngstown Steel Co. and the Cherry Valley Iron Co., located at Youngstown, O., and West Middlesex, Pa., respectively, were blown out for repairs. Three of the four furnaces of the Carnegie Steel Co. at New Castle, were blown in after a month's idleness. We revise quotations as follows:

Bessemer, Valley	$14 25 to 14 50
Bessmer, Pittsburg	15 10 to 15 35
No. 1 Foundry	15 50 to 15 75
No. 2 Foundry	15 10 to 15 35
Gray Froge, Pittsburg	14 35 to 14 60
Basic, Valley	14 25 to 14 50
Basic, Pittsburg	15 10 to 15 35

Steel.—Demand for billets, sheet and tin bars is heavier than at any time in the past four months and consumers are meeting with considerable difficulty in placing their orders. The Carnegie Steel Co. is practically the only producer of sheet bars whose output is not entirely sold up for the remainder of the year. Placing the Youngstown works on rails curtails the company's production of bars the remainder of the year about 35,000 tons and a shortage of steel for independent sheet and tin plate mills is looked for. Bars, long lengths, are now quoted at $25, and cut bars are quoted at an advance of 50 cents. Bessemer and open hearth billets are firm at $23. Rods are easier at $31 to $31.50.

Ferro-Manganese.—Demand is better and carload lots of foreign manganese, 80 percent have been sold at $48.75 to $49 Pittsburg.

Muck Bar.—We note the sale of 100 tons for immediate delivery at $26.25, Youngstown.

Skelp.—The market is quiet and most of the mills are idle. We quote Bessemer grooved at 1.50c and sheared 1.55c. Open hearth is held at an advance of $1 a ton. Grooved iron is quoted at 1.55c and sheared 1.60c to 1.65c.

Rails and Track Material.—The total orders booked by the rail mills this year now aggregate 1,700,000 tons. A large additional tonnage is already in sight, the railroads being anxious to secure deliveries in the next two months, if possible. Rail prices for next year's delivery have not yet been fixed, although the Tennessee Coal, Iron & Railroad Co. has booked a big tonnage for delivery the first half

of the year at $28. This mill and that of the Republic Iron & Steel Co. are not parties to the rail agreement, but the booking of the Tennessee orders at $28 would indicate that this price will prevail for, 1906. Demand for light rails is heavy and prices have advanced. We revise quotations as follows:

Quotations are unchanged as follows: Fifty lb. and over 500 tons, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 16 lb., $27 to $28; 20 lb. $26.50 to $27; 25 to 45 lb., $25 to $26; angle bars for standard sections, 1.25c; spikes, 1.70c.

Plates.—This week the LaBelle Iron Works placed its 84-in. mill in operation for the first time. As soon as the mill is running smoothly it will have an output of about 350 tons daily. Plate tonnage continues heavy and the mills are experiencing much difficulty in making deliveries. At the meeting of the plate manufacturers last week prevailing quotations were reaffirmed and an understanding was reached not to ask premiums on new tonnage offered notwithstanding the deliveries asked. We quote:

Tank plates, ¼ in. thick, 6¼ in. to 14 in., inclusive, 1.50c f. o. b. mill Pittsburg; over 14 lb.: Flange and boiler steel, 10c; marine, A. B. M. A., and ordinary fire box, 20c; still bottom, 30c.; locomotive fire box, 50c; plates over 100 in. up to 110 in. in width, not less than 5c extra; plates 110 in. to 115 in. wide, not less than 10c extra; 115 to 120 in., 15c extra; plates 120 in. to 125 in. wide, not less than 25c extra; plates 125 in. to 130 in., not less than 50c extra; plates 130 in. wide, not less than $1 extra; plates 3-16 in. thick, 10c extra; gauges 7 and 8, 15c extra; No. 9, 25c extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States except Pacific Coast.

Bars.—Local mills have booked considerable business for future delivery at prevailing prices and there is a tendency among producers to contract for only three months' delivery. This is not general, however, as several large contracts have been taken for delivery the remainder of the year. Bar iron continues firm at 1.60c to 1.65c, Pittsburg. We revise quotations as follows:

Bar iron 1.60c to 1.65c Pittsburg; hoops 1.65c, and bands, 1.50c, both taking hoops and band extras respectively. Bessemer steel bars, 1.50c.; open-hearth steel bars, 1.50c.; plow and cultivator, 1.50c, net; channels, angles, zees and tees, under 3 in., 1.65c. The following differentials are maintained on steel: Less than 200 lb. of a size and not less than 1,000 lb., 10 cents advance; less than 1,000 lb. of a size, 30 cents advance.

Structural Material.—At the meeting of the shape manufacturers in New York last week prevailing prices were reaffirmed and the large producers have further agreed not to ask premiums of consumers. One mill outside of the association this week secured a premium of $3 on light angles for prompt delivery and eastern mills are likewise exacting premiums. The American Bridge Co. now has more unfilled orders on its books than at any time in its history, amounting to over 500,000 tons. Prices are unchanged as follows:

Quotations are unchanged as follows: Beams and channels up to 15 in., 1.60c; over 15 in., 1.70c; angles, 3 x 2 up to 6 x 6, 1.60c; zees, 1.50c; tees, 1.65c; angles, from 3 to 16 in., 1.60c; universal and sheared plates, 6¼ to 14 in., inclusive, 1.50c; over 14 in., 1.60c base.

Sheets.—On account of the high prices that the steel mills are asking for bars, the independent sheet mills are inclined to ask higher prices for their product. Only desirable carload orders can be placed at 2.30c, while a few mills are asking 2.35c. We quote:

No. 30, 2.70c to 2.75c; No. 29, 2.60c to 2.65c; No. 28, 2.30c to 2.35c; No. 27, 2.20c to 2.25c; Nos. 25-26, 2.20c; Nos. 23-24, 2.15c; Nos. 18-20, 2.10c; No. 16, 2.10c; Nos. 12-14, 2.05c; No. 9, 2c; No. 8, 1.95c; Galvanized No. 30, 4.30c; No. 29, 3.80c; No. 28, 3.40c; No. 27, 3.20c; Nos. 25-26, 3c; Nos. 23-24, 2.80c; Nos. 18-20, 2.65c; No. 16, 2.50c.

Wire and Wire Nails.—Demand continues light, although jobbers stocks are nearly depleted. Most of the mills are idle but will resume in August to make stock for the fall demand. Prices are unchanged as follows:

We quote: Wire nails, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, and less than carloads, $1.95; painted barb wire, $1.95 for jobbers in carloads; retailers' carloads, $2, and less than carloads, $2.10, with 30c for galvanizing. Annealed smooth fence wire is held at $1.65, with the usual differentials to retailers for carloads and less than carloads. Quotations are all f. o. b. Pittsburg, 60 days, with 2 percent discount for cash in ten days. Iron and steel cut nails, $1.70 to $1.75.

Merchant Steel.—Demand is fair for high grade steel but manufacturers report that shafting is moving freely. We quote:

We quote: Cold rolled and ground shafting, 50 percent off in carload lots, and 45 off in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flat, 1.50c to 1.55c; smooth finished machinery steel, 1.70c to 1.75c; toe calk, 2c to 2.05c.

Pipe and Tubes.—Concessions of three points from the official list are now made and the volume of merchant pipe business has been accordingly increased. Oil country pipe continues quiet and there will be little increase in demand the remainder of the year. Discounts to consumers, carload lots, f. o. b. Pittsburg, plus freight to destination, Tube Rate Book are as follows:

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch	67	51	65	49
⅜ to 6 inches	75	65	73½	63½
⅜ and ½ inch	71	59	69	57
7 to 12 inches	70	55	68½	53
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch	60	48	58	46
½ to 4 inches	67	55	65	53
4½ to 8 inches	63	51	61	49
Double extra strong plain ends, ½ to 8 inches	56	45	54	43

MERCHANT BOILER TUBES, CARLOADS, 22 FEET AND UNDER.

	Steel.	Iron.
1 to 1½ inches	44	41
1¾ to 2½ inches	56	41
2½ inches	58	46
2¾ to 3 inches	64	53
6 to 13 inches	56	41

Less than carloads 2 points less.

Old Material.—Consumers are unwilling to meet the views of the dealers and the prices asked by the steel mills and the deadlock which has been on for several months continues. We quote, gross tons, as follows:

Heavy melting stock, $14 to $14.25; low phosphorus material, $17.50 to $18; rerolling rails, $14.00 to $14.25; cast scrap, $13.00 to $13.25; borings, $8.25 to $8.50; No. 1 Wrought $14.50 to $14.75.

Coke.—W. P. Snyder & Co. have again purchased the output of the Brown & Cochran plant in the Connellsville region for 1906. The price will be adjusted from month to month on a sliding scale basis. We note the sale of 20 cars of furnace coke daily during the next six weeks at $1.75, but producers are unwilling to close for the remainder of the year below $1.90. Foundry coke is moving freely at $2.25 to $2.40. The coke production of the Connellsville region is again increasing the upper region having produced 252,060 tons during the week ending July 15, and the lower region produced 81,516 tons.

The Columbia Lock Nut Co., Bridgeport, Conn., has moved into its new factory, which affords double the capacity of the former plant.

CHICAGO.

Great Activity in Both Iron and Steel—Sheets Alone Weak.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, July 26.

Nothing approaching the activity in iron and steel of a week ago has been witnessed in this market for a long time. The advances in pig iron of $1 a ton in Southern brands and 50 cents a ton in Northern have wholly changed the complexion of the market and apparently mark the beginning of a new era. The suddenness of the move stunned buyers, many of whom were caught napping, and has resulted in a temporary check to the contracting movement. It is to be considered as a masterstroke, however, on the part of producers, for it has placed pig iron in a position where it will not only successfully cope with the bearish onslaughts of melters, but also safely ride any wave of depression which might be felt in the near future. Southern irons are now stiff at $12 Birmingham for No. 2, and local irons at $16.50 Chicago for the same grade. Sales last week by local agents aggregated fully 75,000 tons, the bulk of which was made up of orders averaging 500 tons, indicating the wide distribution of the buying movement. Intermediate and finished iron and steel were no less active than the raw metal. One local interest turned down orders for 20,000 tons of billets, while another has received inquiries for over 500,000 tons of rails. The active demand for the latter is almost phenomenal when the season of the year is considered, and, according to one seller, his mill could book orders for 300,000 tons for next year's delivery in a couple of days if it were willing to sell that far ahead. The demand for structural steel and plates parallels that for rails, the leading maker of these products reporting it has live specifications on hand that will tax the capacity of its plants for the next six months. Producers of steel bars and agricultural shapes are also overwhelmed with shipping orders, and are advising their customers to anticipate their requirements a long time ahead if they wish to insure deliveries. With this condition a well-known fact, and in view of the strengthening of pig iron and scrap, makers of iron bars are not disposed to make concessions to get business. All the local mills have advanced their prices to 1.55c Chicago, and are holding firmly to that figure. Sheets have not been disturbed by the activity in other directions, quotations continuing irregular and the market without backbone, 2.25c Pittsburg for No. 28 gauge being made by a number of independent makers. The demand for merchant pipe and wire products, while not of the best, is considered good for the hot season, and mills are optimistic as to the future. Scrap continues on the upward grade, dealers repeating their old tactics of buying from one another and speculating on the market to boom prices.

Pig Iron.—History was made last week in the pig iron market. Following sharply after one another, Southern furnaces marked up No. 2 Foundry from $11 to $11.50, and from that figure to $12, where it now rests. Northern furnaces also advanced their prices, but only to the extent of 50 cents a ton. The results have justified the move, in the opinion of sellers, for it rounded up a large batch of wavering and shop-worn inquiries, and put new life into the market. Pig iron was never stronger this year, either statistically or sentimentally, and $15.65 and $16.50 Chicago represent the minimum prices asked now for Southern and Northern No. 2 respectively. The bulk of the tonnage closed last week, which is variously estimated at from 75,000 to 100,000 tons, was taken at the lower prices, however the contracting movement receiving a check when the present values went into effect. The tonnage came from a widely distributed area and, in the case of foundry irons, was made up of small lots for limited deliveries, indicating not only the general character of the buying movement, but the prevalence of the belief among melters that it is one of those spurts which mark the progress of the market every year. Northern irons, however, are especially firm, their scarcity adding strength to the local situation. Two stacks, the Mayville and Spring Valley, are out of blast, the Thomas at Milwaukee is reported sold up for the year and withdrawn from the market, while the Iroquois furnaces have so small a tonnage unsold that they are scarcely a factor in the situation. This leaves so small a tonnage from other sources, that but one course in the matter of prices is inevitable. Conspicuous in the trading of last week was the heavy demand for malleable. All the big consumers, including the National Malleable Iron Co., which is figuring on 30,000 tons, were in the market, and all of them closed for a portion of their wants. Some of this tonnage went at less than $16 furnace, though the bulk of it was closed at that figure. A local steel mill bought between 5,000 and 6,000 tons of basic last week at a price below $16. Both the local consumers of this product are now out of the market, the Grand Crossing firm having purchased 7,000 tons the week previous. Silvery irons shared in the activity of the week, and 4 percent to 5 percent Southern silicon was advanced by one maker to $14 Birmingham, while Jackson County 8 percent to 10 percent was raised 50 cents a ton. We have revised our prices, and quote as follows:

Lake Superior charcoal	$17 50 to 17 75
Northern Foundry No. 1	17 00 to 17 25
Northern Foundry No. 2	16 50 to 16 75
Northern Foundry No. 3	16 00 to 16 25
Northern Scotch Foundry	17 00 to 17 25
Ohio Strong Softeners No. 1	17 30
Ohio Strong Softeners No. 2	17 80
Southern Foundry No. 1	16 15
Southern Foundry No. 2	15 65
Southern Foundry No. 3	15 15
Southern Foundry No. 4	14 90
Southern No. 1 Soft	16 15
Southern No. 2 Soft	15 65
Southern Gray Forge	14 65
Southern Mottled	14 40
Southern Silveries (4 percent to 6 percent Silicon)	16 65 to 17 65
Jackson Co. Silveries (8 percent to 10 percent Silveries)	19 80 to 20 30
Alabama and Georgia Car Wheel	20 15
Malleable Bessemer	16 00
Basic Iron	15 65 to 16 15

Billets.—There is no let-up in the demand for billets in this market, one local producer having turned down orders aggregating 20,000 in the week under review because it had no tonnage to sell. Transactions are limted to carload lots of forging steel, for which good prices are obtained. We quote forging billets from $28 to $30, and wire rods, $32 to $33.

Bars.—The stiffening of pig iron has created a buying movement for steel bars among agricultural implement manufacturers. Several contracts were closed in the last ten days for a liberal tonnage, and those that have not already contracted are expected to do so this week. Mills expect a very heavy business the balance of this year and next year, and are advising their customers to anticipate requirements a long time in advance, particularly on heavy sizes of bars and agricultural shapes, to insure their delivery at the proper time. Producers continue to lag behind in filling specifications, some mills being two months late, and others from three to four months. Bar iron has gathered marked strength in the week under review, and is quoted by all the local sellers at 1.55c Chicago. A brisk inquiry has been felt and a round tonnage closed up in lots ranging from 1,500 tons downwards.

Our quotations are as follows: On carload lots, mill shipments, Chicago delivery: Bessemer and open-hearth

bars and bands, 1.66½c base, half extras; soft steel angles, less than 3 x 3, 1.76½c; hoops, 1.81½c base, full extras. Store trade is active and prices are firm. We quote bar iron, 1.90c base, full extras; soft steel bars and bands, 1.85c to 1.95c base, full extras; soft steel angles, channels and tees, under 3 in., 1.95c to 2.05c; hoops, 2.20c base, full extras.

Sheets.—This is probably the only product that has not benefited by the general improvement in the local market. Prices are still ragged, one large buyer reporting that on a recent inquiry he sent out there was a spread of $5 between the highest and lowest quotations received. Generally, however, sheets may be bought from 2.25c to 2.30c Pittsburg for No. 28 gauge, according to the need of the mill for business. As we stated last week, much of the cutting results from the desire of a number of mills which are short on specifications to keep their organizations together and their mills in operation, and to do this are content to take business at practically cost. With the reservations made in this paragraph, our prices are unchanged.

We continue to quote carload lots, mills shipments, Chicago delivery, as follows: Blue annealed sheets, Nos. 9 and 10, 1.81½c; Nos. 11 and 12, 1.86½c; Nos. 13 and 14, 1.91½c; Nos. 15 and 16, 2.01½c. On box annealed, one pass, cold rolled, we quote Nos. 18 and 20, 2.21½c; Nos. 22 and 24, 2.26½c; Nos. 25 and 26, 2.31½c; No. 27, 2.36½c; No. 28, 2.46½c; No. 29, 2.56½c; No. 30, 2.66½c. We quote on lots from warehouse stocks as follows: No. 10, 2.10c to 2.15c; No. 12, 2.15c to 2.20c; No. 14, 2.20c to 2.25c; No. 16, 2.30c to 2.35c; Nos. 18 and 20, 2.50c to 2.55c; Nos. 22 and 24, 2.55c to 2.60c; No. 26, 2.70c to 2.75c; No. 27, 2.75c to 2.85c; No. 28, 2.85c to 2.95c; No. 29, 3c to 3.05c. Galvanized sheets, mill shipments, Chicago delivery, are quoted as follows: Nos. 12 and 14, 2.46½c; No. 16, 2.61½c; Nos. 18 and 20, 2.76½c; Nos. 22 and 24, 2.91½c; No. 26, 3.11½c; No. 27, 3.31½c; No. 28, 3.51½c; No. 29, 3.76½c. Jobbers' prices on lots from store are as follows: Nos. 10 to 14 inclusive, 3.10c; No. 16, 3c; Nos. 18 and 20, 3.10c; Nos. 22 and 24, 3.25c; No. 26, 3.50c; No. 27, 3.70c; No. 28, 3.95c; No. 29, 4.40c; No. 30, 4.85c.

Structural Steel.—Specifications and orders continue to pour in, all clamoring for quick shipment. The leading producer has now enough rolling specifications in hand to operate all its plants for the balance of the year. It cannot keep pace with the wants of its customers, and many are turning to jobbers and independent makers for relief in their distress.

We quote, Chicago delivery, as follows: Beams and channels, 3 to 15 in., inclusive, 1.76½c; angles, 3 to 6 in., ¼ in. and heavier, 1.76½c; angles larger than 6 in., or one or both legs, 1.86½c; beams larger than 15 in., 1.86½c; zees, 3 in. and over, 1.76½c; tees, 3 in. and over, 1.86½c; with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. We quote prices from store as follows: 2.10c to 2.25c for angles, beams and channels, base sizes, with 2.20c to 2.30c for 18, 20 and 24-in. beams; tees and zees, 2.15c to 2.25c. These prices are for either random lengths or cut to specifications in excess of 5 ft.

Plates.—Demand for plates has not lessened an iota, the leading producer having closed up a round tonnage in the week under review for such deliveries as it can give. All the independent mills are rapidly filling up, and with jobbers experiencing greater difficulties every week in getting shipments, there is every expectation of a serious shortage before the end of the year. Prices are very firm.

We quote carload lots, mill shipments, Chicago delivery, as follows: Tank steel, ¼ in. and heavier, 6⅛ in. to 100 in., 1.76½c base; flange steel, 1.86½c base; marine steel, 1.96½c base, all full extras. Plates, 3-16 in. thick, $2 extras; gauges 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. Store quotations are as follows: Tank steel, ¼ in. and heavier, up to and including 72 in. wide, 2c; over 72 in. wide up to 100 in., 2.10c; over 100 in. wide, usual mill extras, 3-16 in. up to but not including 72 in. wide, 2.10c; 3-16 in., 72 in. wide, 2.35c; flange steel, 25c extra; heads, 25c extra.

Merchant Pipe.—New business and specifications continue light, which is not surprising in view of the season of the year. Producers and jobbers, however, are sanguine of the future, and the leading interest is holding firmly to its card prices. It is stated, however, that these quotations are shaded by outside manufacturers. We quote random lengths, f. o. b. Chicago, as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ¼ inches	65.85	49.85	63.85	47.85
⅜ to ½ inches	69.85	57.85	67.85	55.85
¾ to 6 inches	73.85	63.85	72.35	62.35
7 to 12 inches	68.85	53.85	67.35	51.85
PLUGGED AND REAMED.				
	Steel.		Iron.	
1 to 4 inches	71.35	61.35	69.85	59.85
EXTRA STRONG PIPE.				
⅛ to ⅜ inches	58.85	46.85	56.85	44.85
½ to 4 inches	65.85	53.85	63.85	51.85
4½ to 8 inches	61.85	49.85	59.85	47.85
DOUBLE EXTRA STRONG PIPE.				
½ to 8 inches	54.85	43.85	52.85	41.85

Boiler Tubes.—There is no change to note in the local situation. Demand from all branches of the consuming trade is of good proportions, some producing interests being hard pressed to make specified deliveries. Carload lots, Chicago delivery, are without change, as follows:

BOILER TUBES.

	Steel.	Iron.	Seamless.
1 to 1½ inches	40.35	37.35	53.00
1¾ to 2¼ inches	54.35	39.35	40.00
2½ inches	56.35	44.35	43.00
2¾ to 5 inches	62.35	51.35	
		Up to 4½ inches	50.50
6 to 13 inches	52.35	37.35	

Less than carload lots from store, as follows:

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches, inclusive	40	35	42½
1¾ to 2¼ inches, inclusive	50	35	35
2½ inches, inclusive	52½	35	30
2¾ to 5 inches, inclusive	60	47½	42½

Rails and Track Supplies.—The orders for standard sections closed in the past week include 12,500 tons from the Kansas City Southern, and 28,000 from the Gould lines. The Southern Pacific is figuring on 24,000 tons, while an inquiry has been received from a railroad promoter for 380,000 tons to be used in double tracking a proposed line from San Francisco to Denver, which is being figured on. The latter project is not taken seriously, and nothing is expected to develop from it. Light rails are growing in strength and in demand. Track supplies are intensely active.

We quote heavy sections, in 500-ton lots and over, f. o. b. mill, $28; less than 500 tons to carload lots, $30; less than carload lots, $32. Light rails are as follows: 12-lb. sections, $27; 16-lb., $26; 20 and 25-lb., $25; 30, 35, 40 and 45-lb. sections, $24, all f. o. b. Milwaukee mill. Track supplies, f. o. b. Joliet mill, angle bars, 1.40c to 1.50c; spikes, first quality, 1.75c to 1.80c; track bolts, 3¼ x ¾, with square nuts, 2.40c to 2.50c per lb., with hexagon nuts, 2.55c to 2.65c.

Merchant Steel.—Consumers continue to press mills anxiously for deliveries, as well as to load them up with further tonnages. The demand for agricultural shapes has been persistently heavy, and it is expected the output of all the mills will fall far short of the demand.

Prices are without change and we quote carload lots, mill shipments, Chicago delivery as follows: Spring steel, 2.10c; sleigh shoe, flat sizes, 1.71½c; concave and convex, 1.86½c; cutter shoe, 2.35c; smooth finish machinery steel, 1.91½c; smooth finished tire, 1.86c; plow steel, 2.20c and upward, ac-

cording to quality; toe calk steel, 2.21½c. Cold rolled shafting, 50 percent off in carload lots and 45 percent in less than carload lots. Crucible tool steel, 6½c to 8c; special grades of tool steel, 13c and upwards.

Cast Iron Pipe.—Business in the week under review was limited to routine trade, though the total orders make up a good sized tonnage. Prices are firm and in view of the stiffening of pig iron an advance is looked for shortly. We quote carload lots, Chicago delivery, as follows: 4-in., $29; 6-in., 8-in. and 10-in., $28; 12-in. and larger, $27; gas pipe, $1 a ton higher.

Wire Products.—All the mills are comfortably filled with specifications, and find new business of satisfactory volume. Jobbers are gradually working out their large stocks at slightly less than official prices, and the market is gaining strength in consequence. Prices are without change.

We quote carload lots as follows: Wire nails, $1.95; painted barb wire, $2.10; galvanized barb wire, $2.40; smooth annealed wire, $1.80; smooth galvanized wire, $2.10; polished staples, $2.05; galvanized staples, $2.35. Less than carload lots to jobbers are 5 cents higher than above prices. The retail trade is quoted 5 cents extra over the foregoing on carload lots, and 10 cents extra on less than carload lots. Bale ties are unchanged at 82½ and 5 percent to dealers on mixed car lots and 85 percent discount f. o. b. Waukegan, Ill., on straight carload lots.

Coke.—The improvement in pig iron has strengthened coke. Demand for both foundry and furnace fuel is better and prices more uniform. Connellsville furnace coke is held at $2 to $2.10 ovens, while 72-hour foundry coke is quoted $2.40 to $2.50 ovens. Wise county, West Virginia, grades are being offered from $2.40 to $2.50 ovens also.

Old Material.—There is a large amount of speculating and trading going on among dealers. These are competing actively against one another for all the tonnage they can secure, with the result that prices are advancing rapidly. This is but a repetition of their practice of a year ago when prices were pushed up to an abnormal degree, though it ultimately resulted in an active buying movement. There is a fair amount of consumptive demand from foundries and mills, though it is not of enough proportions to attract particular notice. We have revised our prices, and quote gross tons as follows:

Old steel rails (4 feet and over)	$13 50 to 14 00
Old steel rails (less than 4 feet)	13 50 to 14 00
Old iron rails	17 50 to 18 00
Relaying rails, subject to inspection	23 00 to 23 50
Heavy melting steel	13 00 to 13 50
Mixed country steel	10 50 to 11 00

We quote as follows net tons:

No. 1 R. R. wrought	14 00 to 14 50
No. 2 R. R. wrought	13 00 to 13 50
Shafting	15 00 to 15 50
Dealers' forge, No. 1	10 00 to 10 50
Wrought pipe and flues	10 50 to 11 00
No. 1 cast, 150 lb. and less	13 50 to 14 00
No. 1 mill	8 50 to 9 00
No. 1 Busheling	9 75 to 10 25
No. 2 Busheling	8 50 to 9 00
Country sheet	7 00 to 7 50
No. 1 boilers, cut	9 50 to 10 00
Boiler punchings	13 00 to 13 50
Iron car axles	20 50 to 21 00
Steel car axles	15 50 to 16 00
Iron axle turnings	10 50 to 10 75
Cast borings	7 50 to 8 00
Mixed borings, etc.	7 50 to 8 00
Machine shop turnings	9 75 to 10 00
Railroad malleable	12 25 to 12 50
Agricultural malleable	11 75 to 12 00
Stove plate and light cast scrap	9 50 to 10 00
Old iron splice bars	16 00 to 16 25

CINCINNATI.

Advance in Prices Causes Some Hesitation Among Buyers.

July 26.

Pig Iron.—The buying movement of the past two weeks has been sufficiently heavy to bring about an advance in prices of southern iron. Southern furnace interests advanced prices first to $11.50, Birmingham, which was followed about two days later with a $12.00 quotation, and at this writing the market is fairly represented on Southern iron by a quotation of $11.75 Birmingham on Northern Alabama and Tennessee irons, where furnaces enjoy a freight rate differential, and $12.00 Birmingham on strictly Birmingham iron. At these quotations but little business has as yet been done. The bulk of the business placed was at $10.75 to $11.00 Birmingham, but we hear of some sales to belated buyers at $11.50 and $11.75 Birmingham. The rapidity with which southern furnace interests advanced their prices has resulted in producing an unsettled condition, but the real effect of the advance is not as yet apparent. Correspondence from buyers is mainly in regard to the protection of old quotations, and there is nothing to indicate whether the buying movement will be temporarily checked by the sudden advance. Northern irons have not shared materially in the advance in price and recent sales have been reported at $13.50 Southern Ohio furnace, although today $14.00 furnace may be regarded as minimum. Southern grey forge, while stronger than last week, has not fully advanced to the usual difference of $1.00 per ton below No. 2 foundry on prompt shipment business and is obtainable at $10.25 Birmingham with deferred deliveries quoted at $11.00. There is considerable divergence of opinion as to the immediate future of the market, but from present indications it seems that there will be a halt in the buying, at least temporarily. One effect of the advance has been to disturb the relationship between northern and southern irons in Ohio territory. With northern iron at $14.00 furnace and southern at $12.00 Birmingham the northern iron has a decided advantage on strictly a price consideration in Ohio territory. A heavy volume of business was booked during the week, but apparently most of the pending orders have been taken care of or are under negotiation and but little new business since the advance in prices has come to light. We quote f. o. b. Cincinnati:

Southern Foundry No. 1	$15 00 to 15 25
Southern Foundry No. 2	14 50 to 14 75
Southern Foundry No. 3	14 00 to 14 25
Southern Foundry No. 4	13 75 to 14 00
Southern Foundry No. 1, soft	15 00 to 15 25
Southern Foundry No. 2, soft	14 50 to 14 75
Gray Forge	13 00 to 13 75
Northern Foundry No. 1	15 65 to 15 90
Northern Foundry No. 2	15 15 to 15 40
Northern Foundry No. 3	14 65 to 14 90
Jackson County Silvery, 8 percent	18 15

Finished Material.—The market remains fairly active with no change in prices. The demand for structural shapes continues active. The stronger tone to bar iron has been maintained. Bar iron is quoted at 1.60c; steel bars at 1.63c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets at 75 and 7½ percent off. We quote black sheets, No. 27, at 2.40c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.70c; No. 27, 2.60c; No. 16, 2.20c; No. 14, 2.10c; No. 12, 2.05c; No. 10, 2c. Tank plates are firm and sell out of store at 2c for ¼ in. and 2.16c for 3-16, No. 8 and No. 10. Beams and channels are quoted at 2c from stock and angles at 2c to 2.05c. for base sizes.

In merchant pipe independent mills are shading the schedule on attractive orders for certain sizes, but the trade generally is quiet and quotations of the leading interests are unchanged. We quote:

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe. Black.	Steel Pipe. Galv.	Guaranteed Wrought Iron Pipe. Black.	Guaranteed Wrought Iron Pipe. Galv.
	Percent.	Percent.	Percent.	Percent.
⅛ and ¼ inches	65.35	49.35	63.35	47.35
⅜ and ½ inches	69.35	57.25	67.35	55.35
¾ to 6 inches	73.35	63.35	75.85	61.85
7 to 12 inches	68.35	53.35	66.85	51.35

Old Material.—A firmer tone prevails and dealers are demanding full quotations. We quote f. o. b. Cincinnati:

Old No. 1 railroad wrought, net tons	$14 00 to 15 00
Cast machine and foundry, net tons	11 00 to 12 00
Old iron rails, gross tons	17 00 to 17 50
Old steel rails, gross tons	14 00 to 14 50
Old short lengths, gross tons	13 50 to 14 00
Old iron axles, net tons	20 00 to 21 00
Stove plate, net tons	7 00 to 7 50
Wrought turnings, net tons	9 00 to 10 00
Cast borings, net tons	6 00 to 6 50
Car wheels, net tons	13 00 to 13 50

Coke.—The demand is fairly active, but prices show no change. There is a strong inquiry for Virginia furnace coke for prompt shipment from southern furnaces and full prices are obtainable upon any offerings that can be located, but this class of coke is scarce. Foundry coke is quoted at $2.25 to $2.40 f. o. b. Connellsville. Furnace coke at $1.75 to $1.85 at ovens.

CLEVELAND.

Heavy Orders for Steel Bars—Pig Iron Market is Much Stronger.

OFFICE OF *The Iron Trade Review*,
BROWNING BUILDING, July 26.

Iron Ore.—Owing to low water, there has been some delay of down-bound vessels, as a strong westerly wind lowered the water more than a foot at the Limekiln crossing, but in spite of these and some other delays, the movement for the month will be very large, probably exceeding that of June.

Pig Iron.—It was hardly expected that the heavy buying reported last week would be continued this week at the same rate and it has not, but a fair number of rates have been made and the market is distinctly stronger. At a time about ten days ago, when all sellers feared the price would decline still further, some large interests booked large orders at prices somewhat below quotations then being commonly made, which were on a basis of $14 for No. 2 foundry. The result has been a great increase in interest of buyers and a very decided strengthening of the market. Many buyers are now anxious to contract for the second half, but sellers are unwilling to sell at present prices except for prompt shipment. While $14 is still a common price for Bessemer, malleable, basic and No. 2 foundry, a number of furnaces will not sell No. 2 foundry at less than $14.50, and some producers of basic are still piling their iron rather than sell at $14. There seems to be a growing feeling that the Steel Corporation will soon be in the market for Bessemer.

While, as stated in this column last week, there was, for a time, apparently concert of action on the part of large buyers in refraining from coming into the market, the report that a "pool" or "an iron-clad secret organization" has been formed by buyers is so ridiculous as to excite surprise that the canard has been given circulation so extensively.

Southern iron is stronger and some Southern producers are showing a disposition to advance prices rather rapidly.

We quote f. o. b. Cleveland as follows:

Bessemer	$15 00 to 15 35
No. 1 Foundry	15 75 to 15 50
No. 2 Foundry	15 00 to 15 25
No. 3 Foundry	14 75 to 15 00
No. 2 Southern	14 60 to 14 85
Gray Forge	14 25 to 14 50
Gray Forge, Southern	13 25 to 13 50
Lake Superior charcoal	16 25 to 16 50

Finished Material.—The most important sales have been of steel bars and small shapes to agricultural and other interests, the bookings of the principal producer being about 65,000 tons, while other companies enjoyed good business. Steel bars are firm at 1.50c Pittsburg. Bar iron is more active, the usual quotation being 1.50c at the mill. Inquiries for 6,000 to 7,000 tons of standard section rails are pending. It is now estimated that rail orders for the year amount to 1,700,000 tons. Few mills are able to take orders for standard sections for delivery any time this year. Sheets continue to be the one weak spot in the market, competition resulting in the cutting of prices in some cases $5 per ton.

Old Material.—There is a very much stronger market and we have advanced nearly all prices, but the buying is not yet heavy. We quote for Cleveland delivery as follows:

Old iron rails	$19 00 to 20 00
Old steel rails (over 6 feet)	13 50 to 14 50
Old steel rails (under 6 feet)	12 50 to 13 50
Old car wheels	14 50 to 15 00
Steel boiler plate	10 50 to 11 00
Steel axles	16 50 to 17 50
Malleable iron (railroad)	13 50 to 14 50
Malleable iron (agricultural)	12 50 to 13 00
Heavy steel	13 50 to 14 50

We quote as follows, net tons:

No. 1 R. R. wrought	14 00 to 15 00
No. 1 busheling	12 00 to 13 00
No. 1 machine cast	12 50 to 13 00
Iron axles	19 00 to 20 00
Axle turnings	10 00 to 11 00
Wrought turnings (free from cast)	9 00 to 10 00
Grate bars	7 50 to 8 50
Pipes and flues	9 50 to 10 50
Tank iron	8 50 to 9 50
Hoop and band iron	7 00 to 8 00
Sheet iron	6 00 to 7 00
Wrought drillings	9 00 to 10 00
Stove plate	9 50 to 10 00
Cast borings	7 00 to 8 00

PHILADELPHIA.

Pig Iron Shows Marked Improvement—Some Advances Reported.

PHILADELPHIA, July 25.—The upward swing of the market has continued steadily the past week, with every indication that the improvement is to be permanent. It is most noticeable in pig iron, where the temporary depression was felt most acutely, but it is also strongly evident in finished material and the scrap market. The volume of inquiries and orders leaves no doubt of the fact that buyers are in the market to supply pressing demands. Naturally enough this has not only steadied prices, but has led to some advances. While these have not been sensational, they have been sufficient to mark the tendency of the trade and have stimulated inquiries from belated buyers.

Pig Iron.—It is fully three months since so much activity has been reported. Inquiries have been followed by orders for all grades of iron, and optimism again prevails. The great bulk of the orders are for the present quarter, neither buyers nor sellers being much inclined to fix prices much further ahead until more assured of market conditions. Most of the orders are in lots running from 100 to 500 tons, but some have been placed for 1,000 tons and more. The advance in prices of Southern irons has removed a depressing feature and helped to make Northern producers firmer in their demands. The increased activity, in which basic iron has shared, has shown that the nominal figures quoted for it for some time were too high. With this exception, almost every grade of iron has shown an advance. Prices may be quoted as follows:

No. 1X Foundry	$17 00 to 17 50
No. 2X Foundry	16 25 to 16 75
No. 2 Plain	15 75 to 16 25
Standard Gray Forge	14 75 to 15 00
Ordinary Gray Forge	14 25 to 14 50
Basic	15 50 to 16 00
Low Phosphorus	20 25 to 20 75
Southern No. 2X, rail	15 50 to 15 75
Southern No. 2X, dock	15 00 to 15 25

Finished Material.—Nearly every line feels the increased activity, though it is hard to see how the mills running on plates and structural material could be busier than they are. In the lighter line an improved demand is reported. Prices remain unchanged as follows: Beams, channels and angles, according to specifications, 1.73½c to

1.90c; refined iron bars, 1.63½c to 1.80c; steel bars, 1.63½c to 1.70c; plates, 1.73½c to 1.80c.

Old Material.—Increasing orders from the mills have advanced prices for several lines of scrap and encouraged sellers to hold firm in all, in the belief that there will soon be a vigorous demand. As in pig iron, the orders are mostly for prompt shipment, showing that supplies are running low. These prices are quoted:

Old steel rails	$16 00 to 17 00
No. 1 steel scrap	15 00 to 15 75
Old steel axles	17 00 to 18 00
Old iron axles	21 00 to 22 00
Old iron rails	18 00 to 19 00
Old car wheels	14 00 to 15 00
Choice scrap, R. R. No. 1 wrought	17 00 to 18 00
No. 1 yard scrap	15 00 to 16 00
Machinery scrap	14 50 to 15 00
Low phosphorus scrap	19 00 to 20 00
Wrought iron pipe	12 00 to 13 00
No. 1 forge fire scrap	13 00 to 13 75
No. 2 forge fire scrap, ordinary	10 00 to 11 00
Wrought turnings	11 50 to 12 50
Axle turnings, heavy	13 00 to 13 50
Cast borings	8 00 to 8 50
Stove plates	10 50 to 11 00

NEW YORK.

Buying Movement Gains Momentum—Railroads Hungry for Rails.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., July 26.

Pig Iron.—It is becoming more and more evident that the present activity in the pig iron market is a real buying movement including all grades of iron for both present and future delivery. The volume of inquiries continues large and sales have been numerous in spite of an advance in price. Thus far the advance has affected chiefly Alabama irons and in a lesser degree the product of Virginia furnaces, but a very much stronger tone prevails and it is apparently only a question of time when higher prices will rule everywhere. Fully 100,000 tons of iron have been disposed of by local sellers during the week, all classes of consumers being represented with foundry requirements largest and steel plants comparatively little in evidence. Of the total tonnage, approximately one-half is made up of foundry grades mostly in a multitude of small lots for early delivery. Of the remainder probably 20,000 tons is basic, a few thousand tons, charcoal and the rest irons of various grades. Most of the orders were for comparatively small lots, the most notable exceptions being one of 6,500 tons said to have been sold to the American Brake Shoe & Foundry Co., one of several thousand tons, and several varying from 2,000 to 4,000 tons each.

Northern No. 1 Foundry	$16 50 to 16 75
No. 2 Foundry	15 75 to 16 00
No. 2 Plain	15 25 to 15 50
No. 1 Southern Foundry	15 25 to 15 75
No. 2 Southern Foundry	14 75 to 15 25
No. 3 Southern Foundry	14 25 to 14 75
No. 4 Foundry	14 00 to 14 50

Pig Iron Certificates.—On the New York Produce Exchange there was only moderate interest in certificates during the week. Prices have stiffened, but transactions have been few. On Monday two 100-ton lots of foundry sold for $15.20 and $15.30. Foundry warrants follow:

	Bid.	Asked.
August	15.20	15.50
October	15.20	15.40
November	15.00	15.50
December	15.30	15.50
February	15.30	15.70

Finished Iron and Steel.—The activity in heavy shapes which has been a feature of the market for the past few weeks continues, and the demand for lighter lines is also improving. Prices for structural shapes are nominally the same, but one hears frequently of premiums offered for prompt delivery. One urgent consumer is reported to have offered as much as $20 per ton bonus in consideration of immediate shipment. The American Bridge Co. reports that its bookings for the month will be fully up to the high average of last month. Bars and sheets are beginning to feel the quickening influence also, and the outlook is favorable for good fall business at present prices. The tonnage of rails, especially of heavy sections, placed during the past few days is large. Among sales reported are: Missouri Pacific, 22,000 tons; St. L. & Southwestern, 6,000; Chesapeake & Ohio, 4,000; Toledo, Ann Arbor & Detroit, 4,000; Somerset Railway, 5,000; Central R. R. of N. J., 3,500; Buffalo & Susquehanna, 3,500; Spokane International, 17,000; and miscellaneous smaller lots aggregating 23,000 tons. We quote New York prices at tidewater: Angles, 3 to 6 in. x ¼ in. and heavier, 1.74½c; beams, 3 to 15 in., 1.74½c; channels, 3 to 15 in. 1.74½c; beams, 18, 20 and 24 in., 1.84½c; tees, 3 x ¼ in. and heavier, 1.79½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine and ordinary firebox, 1.94½c; refined iron bars, 1.60c; soft steel bars, 1.64½c to 1.67; sheets in carload lots, New York, No. 28, black, 2.40c.

Old Materials.—The demand from consumers seems to have fallen off, but there is a disposition on the part of some of the large dealers to buy at full prices, regardless of quantity. Holders are, however, not anxious to sell, and transactions have been light. Heavy steel scrap is receiving the most attention and there is a fair business. Machinery scrap is also in better demand. In other lines inquiry appears also to be a little more active and the belief that higher prices are at hand is general. Quotations approximately f. o. b. New York are as follows:

Old iron rails	$21 00 to 22 00
Old steel rails, long lengths	14 50 to 15 00
Old steel rails, short pieces	14 00 to 14 50
Relaying rails	20 00 to 21 00
Old car wheels	14 00 to 14 50
Old iron car axles	21 00 to 22 00
Old steel car axles	18 50 to 19 00
Heavy melting steel scrap	13 50 to 14 00
No. 1 railroad wrought scrap	16 00 to 16 50
Iron track scrap	13 50 to 14 00
Wrought pipe	11 00 to 12 00
Cast borings	8 00 to 8 50
Wrought turnings	12 25 to 12 75

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., July 26.

Pig Tin.—The market advanced sharply upon the receipt of a report that Banca sales would be reduced next year. The foreign bull element has apparently no opposition and is still pushing the market upward. Quotations: Spot, 32.60c to 32.70c; July, 32.50c to 32.70c; August, 32.35c to 32.65c; London, £149 15s and £148 17s 6d. Arrivals 3,160 tons to date, with 2,388 tons afloat.

Copper.—The demand for refined copper continues active and prices remain steady. Today's closings follow: Lake and electrolytic, 15c to 15⅛c; casting, 14¾c. London's closings today: £67 15s and £68. Exports for the month to date, 11,532 tons.

Lead.—The local market is steady with prices unchanged. The demand for all grades remains fair. Prices are maintained at 4.55c to 4.60c. St. Louis, 4.50c; London, £13 7s 6d.

Spelter.—The market for spelter is active and strong. Today's closings: Spot, 5.50c to 5.60c; St. Louis, 5.40c; London, £23 15s.

Antimony.—Quiet and irregular describes the market for the past week. Cookson's is nominally 13½c, and Hallett's 13c; other grades, 12c to 12½c.

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STEEL EXPORTS MORE PROFITABLE.

Reports from abroad are at hand to the effect that American steel mills have just made sales of sheet bars for delivery in Great Britain at 80 shillings c. i. f. Liverpool, and on the same basis for delivery in the Midlands through other British ports.

This price is better by some 7 shillings than the lowest of the prices accepted in the movement which was started in November, 1903, when a large tonnage was sold abroad. In that movement there were light sales at 77 and 75 shillings, no large business being tempted until 73 shillings was quoted. Later the American mills, finding the business rather unprofitable, advanced their prices and when they began quoting about 80 shillings, the business dwindled to insignificant proportions. The better prices now obtained are probably due to the workings of the German steel syndicate. It is not greatly in favor among British steel consumers, and they would probably prefer to pay American mills even money for sheet and tin plate bars. The German syndicate's export price on sheet bars is now 76s. 6d. f. o. b. Antwerp, which figures out 80s. or 81s. c. i. f. Newport or Swansea.

At 80s. c. i. f. Liverpool, Swansea or Newport, for sheet bars, the net price realized f. o. b. Pittsburg district steel works would be about $15.50, or a trifle less, the special export freight rates being $1.75 to Boston and New York, $1.55 to Philadelphia and $1.45 to Baltimore. The ocean rate may be assumed at $2.25, although it might be difficult to obtain this from Baltimore, and other charges amount to about 25 cents, making a total cost through Philalelphia or Baltimore of from $3.95 to $4.05, to be deducted from 80s. or $19.44.

Exports of billets and sheet bars through eastern ports during June were recently unofficially reported as follows:

For—	Gross tons.
Liverpool	3,977
Manchester	2,097
Newport	3,154
Swansea	1,220
	10,448

These, of course, represent only a portion of our total exports of crude steel, ingots, billets, sheet bars, etc. In May such exports were officially reported at 17,599 gross tons, while the average for the first five months of this year has been 16,859 gross tons per month.

There is always dissatisfaction on the part of American consumers in regard to sales of raw materials such as they use being made to foreign consumers at less than domestic prices. There are, however, some good things that can be said about the practice. In particular, it must be admitted by everyone in the American sheet trade that if sheet bars were cheaper, sheets would be cheaper also. The price of sheets has persistently adjusted itself, in the past few years, to a very moderate level above cost of manufacture dependent upon the cost of steel. It is gratifying to note, however, that the American mills are now getting somewhat better prices for their steel abroad than they did some 20 months ago when, by the way, the domestic market was neither measurably higher nor lower than it is to-day.

The history of the American iron trade shows that it rarely does the same thing twice in succession, even under practically identical conditions. It is a trade of constant surprises. At one time buyers put off supplying their wants for a longer time than producers think they should, and at another time they buy sooner than they are expected to. The present is a crucial time. Everywhere the opinion is expressed that business will be very active this fall, and that the year 1906 is going to be a record breaker in tonnage and general prosperity. Last fall the condition was that the universal expectation was of excellent business this spring and summer, while there were very few who expected any active buying movement before the new year. The prophets were nearly all wrong, since the buying movement came late in the fall, and several months sooner than was generally expected. At other times buying has been deferred beyond expectations. Present conditions are a duplicate in many respects, and on a small scale, of those which prevailed last fall. Will buyers again be forehanded, placing large orders in August, or will they come in later than producers expect them to? Last year it was a case of everyone trying to get in ahead of everyone else, everyone else not being expected to buy until later. Will they do it again?

LARGE EARNINGS OF THE UNITED STATES STEEL CORPORATION.

INCREASE FOR THE QUARTER OF $15,314,391 COMPARED WITH 1904.

Liberal Provision for Improvements.—Bethlehem Steel Corporation's First Dividend.—Increased Railroad Earnings.—Other Financial News.

(Special Telegram.)

New York, July 26.—The quarterly report of the United States Steel Corporation, made Tuesday, more than came up to expectations and the most significant feature of the report is that after making liberal provision for depreciation, the usual fixed charges and sinking fund, and allowing for the dividend on the preferred stock, there remained a surplus for the quarter of $10,570,681. This is more than double the surplus for the entire year 1904, and is only two million dollars less than the total surplus for 1903, although in the latter year 2½ percent was paid in dividends on the common stock. The falling off in the tonnage of unfilled orders was naturally expected, owing to the lack of demand for such finished products as sheets, tin plate, wire and merchant pipe. The production of sheets and tin plate the first half of the year exceeded all previous records by 36 percent and the curtailed demand was generally expected during the summer months. The liberal buying of billets, sheet bars, rails and steel bars promises to make the unfilled tonnage at the end of the next quarter larger than on June 30, and the trade generally is optimistic about the future. The conservative policy of the corporation is shown in the big amount set aside for general improvements and new construction.

The plants are kept in the highest state of repair and the new construction is more than keeping pace with the country's increasing demand for steel.

The report follows:

Statement of United States Steel Corporation and Subsidiary Companies for the quarter ending June 30th, 1905:

NET EARNINGS.

April, 1905	$ 9,037,925	
May, 1905	10,602,187	
June, 1905	10,665,004	
Total net earnings after deducting, each month, the expenditures for ordinary repairs, renewals and maintenance of plants, also interest on bonds and fixed charges of the subsidiary companies		$30,305,116
Less, appropriations for the following purposes, viz:		
Sinking funds on bonds of subsidiary companies	$ 482,991	
Depreciation and reserve funds (regular provisions)	5,009,563	
Special improvement and replacement fund	1,000,000	
		6,492,554
Balance of net earnings		$23,812,562
Deduct:		
Interest for the quarter on U. S. Steel Corporation bonds held by the public	$5,770,430	
Sinking funds for the quarter on U. S. Steel Corporation bonds, viz.:		
Installments	$1,012,500	
Interest on bonds in sinking funds	154,032	
	1,166,532	
		6,936,962
Balance		$16,875,600
Dividend for the quarter on preferred stock of United States Steel Corporation, 1¾ percent		6,304,919
Surplus for the quarter		$10,570,681
Less, appropriated from surplus for the following purposes, viz.:		
On account of expenditures made and to be made on authorized appropriations for additional property, construction and discharge of capital obligations	$5,000,000	
Specifically set aside for contemplated appropriations and expenditures	$2,500,000	
		7,500,000
Balance of surplus for the quarter		$ 3,070,681

W. J. FILBERT,
Comptroller.

UNFILLED ORDERS ON HAND.

June 30, 1905 ..... 4,829,655 Tons.

BETHLEHEM STEEL CO'S. POLICY.

If the present policy of the Bethlehem Steel Corporation continues, there is no immediate prospect of its securities being listed on the New York Stock Exchange. A statement to the effect that the management of the corporation would list its stock has met with a denial. Evidence of the stock being entirely out of the market was the absence of activity in it, despite the declaration of an initial quarterly dividend of 1¾ percent. The stock is held very closely, Mr. Schwab being the largest shareholder, and it is his desire that the stock find its level free from undue external influence. Only a few hundred shares have changed hands in the last few weeks. The stability of the company is assured both by the conservatism of its management and by the uniform demand for its product, orders for which now exist sufficient to run the plant for a year. Additions and improvements are contemplated and in progress which will enhance the already handsome earnings of the company, amounting to from $3,000,000 to $4,000,000 per annum, very materially in the next few years.

LARGE RAILROAD EARNINGS.

The statement of the railroad earnings for the month of May, as compared with the corresponding month of last year is very favorable, both as to gross and as to net. The compilation of the Financial Chronicle indicates an improvement of $11,133,864 in gross earnings, or 10.13 percent, and an improvement of $3,573,183 in the net earnings, or 10.93 percent.

FINANCIAL NOTES.

Directors of the Page Woven Wire Fence Co. have declared a semi-annual dividend of 2½ percent on the preferred stock, payable Aug. 15.

James R. Goldborough, superintendent of the Newark Iron & Steel Co., filed a petition in bankruptcy Monday. His assets are given at $300, claimed in exemption, and his debts at $7,330.57.

The National Steel & Wire Co., New Haven, Ct., has declared the regular quarterly dividend of 1¾ percent on its preferred stock, payable Aug. 2.

The directors of the American Shipbuilding Co. declared a dividend of 4 percent of the common stock payable quarterly on Sept. 1, which is a resumption of dividends suspended in December, 1903.

The Buffalo Union Furnace Co. and the Union Iron Co. have made a second mortgage for $80,000 to the Erie County Savings Bank, Buffalo, who also hold a first mortgage of $54,000. The debenture is to provide for improvements to the valuable property on Hamburg street.

On July 18 the directors of the Bethlehem Steel Corporation declared an initial quarterly dividend of 1¾ percent on $15,000,000 preferred stock. The preferred stock is on a non-accumulative 7 percent basis.

The Cambria Steel Co. has declared the regular semi-annual dividend of 1½ percent, or 75 cents per share, payable Aug. 15.

W. W. Gibbs, general manager of the Iroquois Machine Co., No. 150 Nassau street, New York, has gone for a couple of months' tour of Europe.

PERSONAL.

Ashley Fulton, formerly salesman with A. M. Crane & Co., Chicago, has joined with his brother, Eliot, in the organization of the firm of Fulton Brothers, iron and steel jobbers. Offices have been established at 543-545 The Rookery, Chicago.

Arthur Simonson, superintendent of the foundry of Wm. Wharton Jr. & Co., Philadelphia, will start on a trip to Europe next month.

J. W. Daugherty, superintendent of the Steelton Works of the Pennsylvania Steel Co., has sailed for Europe, where he will visit works in England and Germany.

The Dayton Hydraulic Machinery Co., Dayton, O., builder of the Brooks centrifugal pump, has opened a New York office at 133 Liberty street, with R. E. Spencer Geare in charge.

In order to give his undivided time to the L. Candee Co., New Haven, Conn., of which he is vice president and secretary, H. Stuart Hotchkiss has resigned as president and treasurer of the National Steel Foundry Co., of that city.

President H. M. Pellatt, of the Electrical Development Co., of Ont., Ltd., has been elected a director of the Dominion Iron & Steel Co., Sydney, C. B.

W. W. Gibbs, vice president and general manager of the Iroquois Machine Co., New York City, sails for Europe this week, where he will remain for over a month.

The Lackawanna Steel Co. has notified C. E. Walton, who for the past two years has been superintendent of the company's Brotherton and Sunday Lake mines, Gogebic range, that he has been appointed assistant general manager of the company's mines in Michigan. He is to be succeeded in his previous position by Captain John Hooper.

Clayton Mark, president of the Mark Mfg. Co., Chicago, director of the National Malleable Castings Co. and general manager of the Chicago Malleable Iron Works branch, because of his many business interests, has resigned from the Chicago board of education.

John Reis, formerly district manager of the New Castle and South Sharon plants of the Carnegie Steel Co., and now assistant to Wm. E. Corey, president of the United States Steel Corporation, with offices in New York, has decided to move from New Castle to Mt. Claire, N. J.

F. A. Goodrich, of the F. A. Goodrich Iron & Steel Co., St. Louis, who underwent an operation for appendicitis late in June, has so far recovered that he is again at his desk and will leave for a period of rest, hoping to return in the fall fully recovered.

Several changes were made in the organization of the Pressed Steel Car Co., Pittsburg, to be effective July 18. With the resignation of C. Flinn as assistant general manager, that position was abolished and Frank Ditchfield, formerly assistant chief engineer, was appointed general superintendent for the company's plants. J. V. Maher, formerly general freight agent, and James B. Rider, formerly private secretary to the general manager, were appointed assistants to the vice president. Mr. Maher will be located at McKees Rocks and Mr. Rider at the company's offices in Pittsburg.

The Sharon Foundry Co., Sharon, Pa., will build a 20-ton open hearth furnace and will furnish iron castings as well as steel. Joseph Riddell has resigned as president and manager, and W. W. Shilling was elected to succeed him, and P. McManus has been appointed superintendent. Mr. McManus was with the American Steel Casting Co., now the American Steel Foundry, for a number of years, and for the past two years was superintendent of the Stirling Steel Foundry at Braddock, Pa.

NEW PLATE MILL

Placed in Operation at LaBelle Works—Increasing Use of Mixers.

The LaBelle Iron Works, Steubenville, O., this week placed its new 84-in. plate mill in operation. This mill has been under construction for the past six months and orders are already on the books of the company sufficient to insure full operation for the next three months. The installation of a mixer is being considered, as well as the erection of three additional open-hearth furnaces. The present steel capacity is insufficient to met present demands and on account of the operation of the plate mill the consumption of steel will be increased about 350 tons daily. The use of the mixer at open-hearth plants is becoming more general, the Carnegie Steel Co. this week having placed a metal mixed in operation at its South Sharon, Pa., plant. At the Clairton plant of the Carnegie Steel Co. scrap is placed into the mixer and melted before being charged into the open-hearth furnaces, effecting a saving of heat in the furnaces, while the number of heats is increased.

Judge Gary on Trade Outlook.

(Special Telegram.)

New York, July 26.—Judge E. H. Gary, chairman of the Board of Directors of the U. S. Steel Corporation, said to a correspondent of the Iron Trade Review:

"I consider the outlook for the iron and steel industries, on the whole, very favorable. Our bookings have been better than last year—better in some lines than in others, which was to be expected—not as yet equal to our capacity, but good.

"I am not fond of guessing about the future. Guesses have a way of turning out badly. But I have confidence in the future of the iron and steel industries of the country, and," with a smile, "naturally also in the future of this corporation."

New Steel Casting Plant.

(Special Telegram.)

Pittsburg, Pa., July 26.—Wm. F. Watson and other Pittsburg capitalists, together with Alliance, O. capital, within a short time, will erect a large steel casting plant at Alliance, the plans having been prepared in Philadelphia three years ago. Mr. Watson was formerly sales agent for American Steel Foundries, and he has promoted the new enterprise, which will make steel castings of all descriptions, and it is said the capacity will be 1,200 to 1,500 tons per month.

Shipping to Colorado.

The novel spectacle is just now presented of iron ore being shipped to the Rocky mountain region from the Lake Superior district. The ore is from Corrigan, McKinney & Co.'s Stevenson mine, Mesabi range, and is being forwarded to fill a heavy order from the Colorado Fuel & Iron Co. Shipments will be made daily for some months to come.

The Odlum-Taylor Co., Memphis, Tenn., recently incorporated, is in the market for 100 to 150 tons of structural work, Corliss single or automatic engine and direct connected alternating three-phase generator, one lot alternating current motors of from three to 20 h. p., electric traveling crane of 15 tons and 45 ft. span, hydraulic riveter, and hydraulic flange press, air compressor 350 ft. with full pneumatic equipment, motor driven (alternating current); shears, punches, rolls, etc., as well as radial drill, valves and fittings and small tools.

PRODUCTION OF PIG IRON IN THE UNITED STATES IN THE FIRST HALF OF THE YEAR 1905.

Statistics collected from the Manufacturers by The American Iron and Steel Association, all in Gross Tons.

Production in the First Half of 1905, 11,163,475 Gross Tons. Stocks on the Market, June 30, 1905, 539,269 Tons.

For explanation of Warrant Yard Stocks see foot of second column.

Production of All Kinds of Pig Iron.

TOTAL PRODUCTION OF PIG IRON.

States.	Blast Furnaces. In blast Dec. 31, 1904.	June 30, 1905. In	Out	Total.	Gross tons of 2,240 lbs. (Includes spiegeleisen, ferro-manganese, etc.) First half of 1904.	Second half of 1904.	First half of 1905.
Massachusetts	1	1	1	2	1,242	1,907	7,696
Connecticut	2	2	1	3	4,325	4,597	
New York	12	13	10	23	250,980	354,729	550,208
New Jersey	5	6	5	11	121,294	141,000	165,991
Pennsylvania	108	124	50	154	3,713,867	3,930,454	5,226,691
Maryland	4	3	3	6	135,416	158,025	156,334
Virginia	12	15	11	26	186,037	124,499	240,672
N. Carolina			1	1			
Georgia	2	1	3	4	44,342	31,344	25,752
Texas	1	1	3	4			
Alabama	25	29	21	50	800,256	653,257	743,547
West Virginia	4	2	2	4	103,133	167,792	149,016
Kentucky	3	2	7	9	17,516	19,500	32,793
Tennessee	10	15	6	21	165,862	156,213	195,757
Ohio	43	42	23	65	1,540,745	1,437,186	2,181,058
Illinois	12	19	2	21	798,221	857,770	979,157
Michigan	6	9	3	12	188,744	94,481	147,958
Wisconsin	6	6		6	104,437	105,967	184,234
Minnesota	1		1	1			
Missouri	2	1	1	2			
Colorado	2	3	2	5	46,982	104,794	176,376
Oregon			1	1			
Washington			1	1			
Total	261	294	138	432	8,173,438	8,323,595	11,163,175

PRODUCTION OF BITUMINOUS COAL AND COKE PIG IRON.

New York	9	11	2	13	220,448	236,758	490,900
New Jersey	3	2	3	5	39,427	114,726	126,644
Pennsylvania	73	86	13	99	3,184,795	3,365,292	4,483,282
Maryland	3	3	2	5	133,493	157,412	156,108
Virginia	11	14	8	22			
N. Carolina			1	1	204,543	144,956	259,996
Georgia	1		1	1			
Alabama	24	27	17	44	780,423	642,599	729,845
West Virginia	4	2	2	4	103,153	167,792	149,016
Kentucky	3	2	6	8	17,516	19,500	32,793
Tennessee	10	14	4	18	165,086	134,360	195,180
Ohio	43	41	17	58	1,539,785	1,437,186	2,180,558
Illinois	12	19	2	21	798,221	857,770	979,157
Michigan	1	1		1			
Wisconsin	5	5		5	112,238	106,114	182,415
Minnesota	1		1	1			
Missouri	1		1	1	36,165	117,580	188,191
Colorado	2	3	2	5			
Total	206	229	82	311	7,337,279	7,504,085	10,162,488

PRODUCTION OF ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

New York	3	2	6	8	92,644	42,118	49,304
New Jersey	2	4	2	6			39,347
Pennsylvania	33	36	15	51	528,422	562,219	741,524
Maryland					1,737		
Total	38	42	23	65	622,803	605,337	830,175

PRODUCTION OF CHARCOAL PIG IRON.

Massachusetts	1	1	1	2	1,242	1,907	8,640
Connecticut	2	2	1	3	4,325	4,597	
New York			2	2	19,757	10,147	
Pennsylvania	2	3	2	5	650	1,943	1,885
Maryland	1		1	1	1,753	3,382	1,125
Virginia	1	1	3	4			
Alabama	1	2	4	6	19,834	10,658	13,702
Georgia	1	1	2	3			
Texas	1	1	3	4			
Kentucky			1	1	23,067	9,761	6,703
Tennessee		1	2	3			
Ohio		1	6	7	958	30	500
Michigan	5	6	5	11	111,659	59,866	104,564
Wisconsin	1	1		1			
Missouri	1	1		1	39,117	21,682	33,373
Oregon			1	1			
Washington			1	1			
Total	17	23	33	56	213,356	124,173	170,512

TOTAL PRODUCTION OF ALL KINDS OF PIG IRON ACCORDING TO FUEL USED.

Bituminous	206	229	82	311	7,337,279	7,504,085	10,162,488
Anthracite	38	42	23	65	622,803	605,337	830,175
Charcoal	17	23	33	56	213,356	124,173	170,512
Total	261	294	138	432	8,173,438	8,323,595	11,163,175

Unsold Stocks of All Kinds of Pig Iron.

TOTAL STOCKS OF UNSOLD PIG IRON.

States.	Gross tons of 2,240 lbs. Dec. 31, 1903.	June 30, 1904.	Dec. 31, 1904.	June 30, 1905.
Massachusetts and Conn.	2,452	3,142	1,451	1,380
New York	12,932	26,517	23,957	25,401
New Jersey	9,892	14,959	9,048	12,124
Pennsylvania	106,472	114,477	55,538	80,163
Maryland and Virginia	25,823	29,880	31,032	15,467
North Carolina, Ga., and Tex.	10,226	31,576	14,495	18,664
Alabama	234,828	110,814	112,673	96,460
Kentucky and West Va.	16,422	2,315	15,936	20,499
Tennessee	22,019	15,781	5,380	32,810
Ohio	72,180	99,942	38,500	94,656
Michigan and Minnesota				
Illinois and Wisconsin	77,183	123,851	100,896	94,693
Missouri and Colorado				
Pacific States				
Total	591,438	623,254	408,792	480,319

STOCKS OF UNSOLD BITUMINOUS COAL AND COKE PIG IRON.

New York and New Jersey	4,967	11,240	16,398	13,477
Pennsylvania	55,966	80,773	38,057	44,831
Maryland and Virginia	28,047	67,236	28,649	14,055
Alabama, Georgia, and N. C.	206,029	83,140	88,613	90,605
Kentucky, West Va., and Tenn.	38,109	17,307	20,702	52,932
Ohio	67,324	96,182	36,332	92,858
Illinois, Mich., and Minn.				
Wis., Missouri, and Colorado	13,416	25,322	11,952	13,338
Total	407,881	381,201	240,703	322,096

STOCKS OF UNSOLD ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

New York	4,106	2,167	2,142	3,482
New Jersey	9,892	14,959	9,048	5,624
Pennsylvania	48,903	32,614	16,396	33,984
Total	62,901	49,740	27,586	43,090

STOCKS OF UNSOLD CHARCOAL PIG IRON.

Massachusetts and Conn.	3,452	3,142	1,451	4,922
New York	3,859	13,110	5,417	
Pennsylvania	1,574	1,090	1,085	1,348
Md., Virginia, Ga., and Tex.	13,002	26,593	13,774	8,280
Alabama	28,799	35,301	27,164	18,028
Tennessee	338	780	800	
Ohio	4,865	3,760	2,168	1,800
Michigan				
Wisconsin				
Missouri	64,767	108,526	93,944	81,355
Pacific States				
Total	120,656	192,313	146,503	115,133

STOCKS ACCORDING TO FUEL USED.

Bituminous	407,881	381,201	240,703	322,096
Anth. and anth. and coke	62,901	49,740	27,586	43,090
Charcoal	120,656	192,313	140,503	115,133
Total	591,438	623,254	408,792	480,319

STOCKS OF PIG IRON IN PENNSYLVANIA AND OHIO.

Pennsylvania. Lehigh Valley	33,324	29,434	10,826	21,507
Schuylkill Valley	14,079	5,580	2,800	15,447
Upper Susquehanna V. / Lower Susquehanna V.	1,021	1,989	1,258	2,209
Juniata Valley	19,617	12,170	7,786	6,458
Allegheny County	1,200			
Shenango Valley	9,222	23,202	28,289	28,148
Miscellaneous bituminous	26,435	41,012	3,484	6,946
Charcoal	1,574	1,090	1,085	1,348
Ohio. Mahoning Valley bitum.	47,849	55,624	20,455	58,041
Hocking Valley "		1,200		4,001
Lake Counties "		8,368		
Miscellaneous "		9,548	5,626	21,789
Hanging Rock "	19,475	21,442	10,245	14,027
Hanging Rock charcoal	4,865	3,760	2,168	1,800

Warrant Yard Stocks.

The American Pig Iron Storage Warrant Company held 88,900 tons of pig iron in its yards on June 30, 1905, as compared with 55,350 tons on December 31, 1904. Of the quantity stored in its yards on June 30, 1905, 29,950 tons were reported to us as being controlled by the makers, leaving approximately 58,950 tons which had passed from their control, and which should be added to the 480,319 tons of unsold stocks reported above, making a grand total of 539,269 tons of pig iron on the market on June 30, 1905, against 446,442 tons on December 31, 1904, 623,254 tons on June 30, 1904, 598,489 tons on December 31, 1903, and 126,301 tons on June 30, 1903.

Miscellaneous Pig Iron Statistics.

PIG IRON PRODUCTION IN PENNSYLVANIA AND OHIO.

Districts.	Blast Furnaces. In blast Dec. 31, 1904.	June 30, 1905. In	Out	Total.	Gross tons of 2,240 lbs. (Includes spiegeleisen, ferro-manganese, etc.) First half of 1904.	Second half of 1904.	First half of 1905.
Pennsylvania. Lehigh V.	17	21	6	27	231,427	224,601	316,721
Schu'l "	10	11	5	16	190,606	218,810	290,266
U. Sus. "			1	1			
L. Sus. "	8	15	4	19	175,437	221,719	282,967
Juniata "	5	6	4	10	57,607	62,864	107,723
Alle'y Co.	38	40	1	41	2,142,570	2,240,599	2,716,668
Shen. V.	17	14	6	20	455,563	555,877	892,334
Mis. bit.	11	14	1	15	460,007	404,041	627,627
Charcoal	2	3	2	5	650	1,943	1,885
Ohio. Mah. Val.	15	13	3	16	551,969	665,217	855,336
Hock. "		1	2	3	16,409	418,404	558,092
Lake Co's	9	10	2	12	390,053		
Mis. bit.	11	8	7	15	441,801	245,800	594,140
H. R. bit.	8	9	3	12	139,562	107,735	172,990
H. R. char		1	6	7	958	30	500

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

New York and New Jersey	98,651	151,832	239,525
Pennsylvania	2,365,111	2,246,898	2,955,978
Maryland	135,230	157,412	156,108
West Virginia	102,117	165,388	144,822
Kentucky and Tennessee	11,020	14,189	9,033
Ohio	1,151,235	987,207	1,506,334
Illinois	700,872	723,158	796,763
Michigan, Wisconsin, and Minn.	39,430	36,601	59,908
Missouri and Colorado	27,280	85,038	139,954
Total	4,530,946	4,567,713	6,008,427

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON IN PENNSYLVANIA AND OHIO.

Pennsylvania. Lehigh Valley	41,836	22,658	37,301
Schuylkill Valley	18,816	20,157	18,234
Upper Susquehanna Valley / Lower Susquehanna Valley / Juniata Valley	137,007	118,064	218,957
Allegheny County	1,525,195	1,450,401	1,865,597
Shenango Valley	346,637	405,601	585,501
Miscellaneous bituminous	195,620	229,987	231,288
Ohio. Mahoning Valley	423,962	490,483	593,859
Hocking Valley			
Lake Counties	298,692	298,240	417,923
Hanging Rock bituminous	63,391	38,285	59,736
Miscellaneous bituminous	365,190	160,219	435,716

PRODUCTION OF BASIC PIG IRON, NOT INCLUDING CHARCOAL IRON.

New York and New Jersey	51,949	61,739	92,939
Pennsylvania—Allegheny County	542,398	702,744	753,449
Other counties	261,200	299,405	657,930
Virginia, Tennessee, and Alabama	130,129	189,209	201,524
Ohio, Illinois, and Missouri	76,225	168,115	250,750
Total	1,061,901	1,421,303	1,956,592

PRODUCTION OF ALL KINDS OF PIG IRON FROM 1901 TO 1904 BY STATES.

States.	Gross tons of 2,240 pounds. 1901.	1902.	1903.	1904.
Massachusetts	2,386	3,360	3,265	3,149
Connecticut	8,442	12,086	14,501	8,922
New York	283,662	401,369	552,917	605,709
New Jersey	155,746	191,380	211,667	282,294
Pennsylvania	7,343,257	8,117,800	8,211,500	7,644,321
Maryland	303,186	303,229	324,570	293,441
Virginia	448,662	537,216	544,034	310,326
North Car. / Georgia / Texas	29,606	35,410	87,255	75,686
Alabama	1,225,212	1,472,211	1,561,398	1,458,513
West Virginia	166,597	183,005	190,013	270,945
Kentucky	68,462	110,725	102,441	37,106
Tennessee	337,139	392,778	419,368	392,096
Ohio	3,326,425	3,631,388	3,287,434	2,977,929
Illinois	1,596,850	1,730,220	1,692,375	1,655,991
Michigan	170,763	155,213	246,709	233,225
Wisconsin / Minnesota	207,551	273,967	283,516	210,404
Missouri / Colorado / Washington	308,409	289,930	270,389	151,776
Total	15,878,354	17,821,307	18,009,252	16,497,033

IMPROVED CONDITIONS

ARE REPORTED IN GREAT BRITAIN IN IRON AND STEEL BUSINESS.

Proposed Migration from Birmingham—Troubles of Old Fashioned Plants—Orders for Manchurian Railway.

(Special Correspondence.)

Birmingham, England, July 15.—The quarterly meetings held this week, as well as the publication of half-yearly statistics, facilitate a better estimate than for some time past of the condition of the British iron trade. The most important of the four meetings held in the iron centers is the one at Birmingham, which took place a couple of days since, and was very largely attended by shipping agents, though the Royal visit kept away a number of Manchester representatives. The iron and steel trade generally is showing some recovery of strength, this being particularly noticeable with regard to pig iron, dealers in which have been able to recover the shilling per ton sacrificed some six or seven weeks ago, and prices are thus restored to about the standard of the April quarterly meeting. On the other hand the finished iron markets are strengthened by the reduction of output consequent upon the heat, which has completely suspended operations during the past few days at some establishments, while a good many are losing heats and generally reducing their make. The tone is fairly cheerful, owing to marked increases in the demand for shipbuilding, railway rolling stock, engineering, and bridge building, all of which consumers of iron must come on the market shortly for increased supplies.

Within the past few days, the large Birmingham wagon building firm of Messrs. Brown, Marshalls & Co. have booked an order for 550 wagons for the Manchurian railway, which are to be delivered at the rate of 40 per month, shipped from Hull for a secret destination. They are mostly covered goods trucks, made to the standard Japanese gauge, which is narrower than the Russian. Several other large orders have previously been received by the various Birmingham wagon building companies for the far East as well as for India and South America. The Metropolitan Carriage & Wagon Co., Ltd., has had a large share of these orders and this concern has lately been making large extensions to its plant at Saltley, the effect of which, it is claimed, will be to make the equipment equal to any in the world. The same firm has lately installed a heavy plant at its Wednesbury establishment for the manufacture of pressed steel underframes. This establishment has during the past few years been built up into a huge syndicate, of which an important department is the Patent Shaft & Axletree Co. at Wednesbury. J. P. Lacy is the chairman of this concern, and probably no place in the kingdom has in the same period been more completely modernized. Mr. Lacy fully grasps the requirements of the trade and has introduced most important mechanical appliances. The Bessemer plant has been removed to make way for Siemens furnaces, while some of the largest mills have had their output completely doubled. Electric light has everywhere replaced gas, and electric power is being extensively introduced. The firm fully maintains its reputation as one of the largest bridge building concerns in the kingdom. It is significant, however, that the firm recently found it necessary to complain of the heavy rating by the local authority and threatened to retaliate by removing a portion of its plant to the coast, thus escaping not only the heavy rates but also the most extravagant railway charges which are doing so much to handicap Midland firms.

Migration and rumors of migration go on almost constantly in this unfortunate district. A year or two ago Lysaght & Co. found it necessary to transfer their twenty sheet rolling mills from Wolverhampton to Newport, Mon., thereby inflicting the severest blow that the hardware center has ever sustained in its somewhat checkered history. The Lysaght plant is thoroughly up-to-date and modern, and the firm has now captured the lion's share of England's trade in exported sheets.

The latest local firm to threaten removal is that of W. and T. Avery, Ltd., the well-known makers of weighing machines, whose fortunes are presided over by Walter Chamberlain, a brother of the distinguished fiscal reformer. This gentleman warned his shareholders a few days ago that in view of the heavy tariffs imposed by foreign countries, and the refusal of English politicians, so far, to grant protection to British houses, the directors had already commenced negotiations with a view to the establishment of a large department in a Continental center, where protection prevails and the conditions are more favorable. Signs are not wanting that the trade of the district is gravitating into the hands ot those large and well capitalized firms which are able to bring up their plants to modern requirements.

Apparently, the great firm of J. and S. Roberts, Ltd., of the Swan Foundry, West Bromwich, seems destined to share the fate of a number of famous concerns which within the past ten years have passed into oblivion. The firm was once one of the most renowned in the world, with a great reputation for cast iron gas and water pipe. Its works occupy an area of 18½ acres, with a mineral area of 25½ acres; but the entire establishment is to be sold by auction in Birmingham on Thursday next. There are no fewer than 60 buildings of various descriptions on the site. For some time past pipe casting has been abandoned as unprofitable. No doubt this misfortune is due to the old fashioned character of the plant, with the extensive area and the general lack of economical considerations in the laying out of the works, which has involved much waste in respect of haulage and in other directions, while it has increased the difficulty of supervision. The culminating misfortune has been the closure recently applied by the principal debenture-holder. The South Staffordshire area is quite unequaled in respect of the proportion it possesses of out-of-date plants, and more failures may be anticipated at a not very distant future. Among the recent misfortunes of local ironmasters has been the general withdrawal of discount formally allowed by colliery owners, which in some directions this has been a kind of last straw in bringing about their downfall.

Among the baronets recently created by the King on his birthday was Sir Charles Holcroft, a gentleman who has been brought into some prominence of late through his munificent gift of £10,000 to the Birmingham University. Sir Charles is a very well-known local ironmaster connected with the firms of Thomas and Charles Holcroft, Tipton; Horsley Engineering Works, Tipton; Thomas Holcroft & Sons, Ltd., iron founders, Wolverhampton; the Conduit Colliery, and the Lyttleton Colliery, Cannock Chase.

A number of large firms have benefited in connection with the equipment of the Birmingham University, the new buildings of which at Bournbrook are approaching completion, and the Brush Electric Engineering Co. has lately secured an order for a motor generator set for educational purposes; the same firm has lately secured an order from the Aston Corporation for overhead tram-

way equipment. Municipal tramway enterprise has brought grist to the mill of a number of Midland firms which cast the tramway joints and turnouts, although in some directions the competition of Germany has been somewhat severely felt. Reverting to shipbuilding, returns recently issued show that there were 472 vessels under construction during the quarter ended June 30, with a tonnage of 1,301,457, against 392 vessels with a tonnage of 993,088 for the previous quarter. The highest recorded tonnage was that of September, 1901, as compared with which the recent total, high as it is, still shows a deficiency of 110,000 tons. The returns with regard to machinery exported have caused some elation, locomotive engines showing an increase for the six months of value amounting to £213,000 over the same period of 1904. The total value of steam engines and machinery sold on foreign and colonial account was £11,000,016, compared with £10,301,813 for the corresponding period of 1904. A weak place in the British iron and steel trade is shown under the head of "girders, beams, etc," of which we exported 31,421 tons, whereas we imported 53,928 tons, a difference against the English trade of 22,507 tons. For years past the general insufficiency of British plants for the production of solid girders has been notorious, but of late there has been some improvement in this respect. One of the biggest bridge building enterprises ever undertaken in this country is now making satisfactory in the hands of the Cleveland Bridge & Engineering Co. The firm is constructing the new high level bridge for the Northeastern Railway over the Tyne at Newcastle. This is said to be the biggest span built since the erection of the Forth bridge. There are five girders to each span, weighing 350 tons each.

On the whole the general trade outlook is more cheerful than for months past, and as harvest prospects seem tolerably bright, a good rural demand for finished iron is anticipated. The iron manufacture is handicapped a good deal by dear material and high wages, but a good autumn trade is anticipated, which may even develop into a boom, if the hopes of peace in the far East are realized.

One of the largest firms in the district, Roberts & Cooper, of Stourbridge and Tipton, recently had a rare and curious experience. Some years ago a customer failed with a debt to the firm of over £1,000, the whole of which turned out to be bad. Warned by this experience they declined for a considerable time to give credit to the debtor's son, but as he proved exemplary they eventually ran up an account of £30. Then he in turn failed and emigrated to Manitoba. This was five years ago, and the creditors, who are the owners of an extremely prosperous Black Country concern, had long since wiped off the account as a bad debt. The other day they were greatly astonished to receive from the debtor a check for £27.10, with a polite intimation that this was in payment of an installment of £20 towards the £30 due, and £7.10 interest covering the period of five years. The remaining ten pounds with a like proportion of interest, the conscientious sender promised to forward shortly.

Brazilian Officers Visit Bethlehem Plant.

Thirty officers and four gunners of the Brazilian training ship Benjamin Constant, under command of chief officer Nunez de Louza, last week visited the Bethlehem Steel Works as the guests of Charles M. Schwab. The visistors after inspecting the various departments, were taken to the proving grounds at Redington, where they witnessed the firing of naval guns. The foreigners returned by special train to their ship in New York harbor.

STEEL WORKS

In Operation as Part of a University—British News Notes.

An important feature of the University of Sheffield, England, opened July 12 by the King, is the equipment of the steel laboratories. There are full-sized Siemens, Bessemer and crucible steel furnaces, scientifically installed and working under the direction of a highly-trained staff, constituting a practical steel works on a manufacturing scale. It is especially fortunate that Sheffield, the great steel center, should have an institution devoted to the most scientific methods of instruction and research in this national industry.

The old armor rolling plant of the Cyclops works, of Cammell, Laird & Co., is being replaced by modern buildings and equipment. Davy Bros., Ltd., of the Park Iron Works, Sheffield, have the contract, and the work is being pushed as rapidly as possible.

The second annual convention of the members of the British Foundrymen's Association will be held in the new Lecture Hall of the Glasgow and West of Scotland Technical College, Glasgow, on Aug. 7, 8 and 9. Papers will be read by the following men: H. Pilkington, vice president; Professor Sexton, on "Technical Education and the Foundry"; A. Campion, Carnegie Research Scholar, "The Microscope and Pig Iron"; Percy Longmuir, metallurgist and Carnegie medallist, "Moulding Sands and Fire-Clays"; J. G. Stewart, "The Commercial Side of the Foundry Trade." Visits will be made to the Carron Iron Works, and to other steel foundries.

The death is announced of Mr. W. Bartle, of F. Bartle & Sons, Basset Foundry, Carn Brea, Cornwall, England, at the age of 48 years.

The Iron and Coal Trades Review says: "According to the returns issued by the Association of Iron and Steel Producers, the make of pig iron in Germany and Luxemburg in May amounted to 951,431 tons, as compared with 867,477 tons in the corresponding month of 1904."

The Ironmonger of July says: "There is not very much demand for semi-manufactured steel, and what business there is appears to be going either to British works or to American mills, for we understand that the last named have taken at least one good order from the northwestern district during the past few days in addition to booking a fair line recently in the Midlands. So far as the German syndicate is concerned, stagnation is the order of the day. The air is full of rumors regarding the steps which the British merchants have in view in connection with the boycotting tactics which are still persisted in so far as they are concerned by the German Steelworks Union, and it is being hinted that a move is afoot which may ultimately tend to relieve the present disabilities under which merchants here are laboring."

Brownlie & Murray, Ltd., structural engineers, Possilpark, Glasgow, have secured a large order for steel-framed buildings for engineering workshops in Japan. Several hundred tons of steel will be required for the contract.

Improvements will soon be made at the Dowlais Steel Works, involving an expenditure of £250,000. New blast furnaces of the most up-to-date pattern will be erected under the supervision of Mr. David Roberts, Cardiff, Glamorganshire, England.

Peter Pilkington, Ltd., Bamber Bridge, Lancs., England, has been registered with a capital of £30,000. The concern will manufacture steam hammers, forging machinery and plant and mining machinery and accessories, and will be mining, mechanical, and electrical engineer,

founder, etc. The directors are: G. W. Grimshaw, D. L. Sprake, J. Wild and C. A. Greenhalgh.

F. Smith & Co., Ltd., has been registered for the purpose of acquiring the iron buildings and roofing business of F. Smith & Co., Carpenter's Road, Stratford, London, E. The capital is £12,000.

Hardie & Munroe have acquired the Loanhead Foundry, Loanhead, Lanark, Scotland, from Aitchison & Co.

William Benson, Ltd., has been registered to acquire the business carried on at the Robin Works, 39 Robin Hood street, Nottingham, Nottinghamshire, England. The new concern will carry on the business of iron founders, manufacturers of agricultural implements, toolmakers, etc. The capital is £4,000, and the first directors are: W. Benson, H. W. Benson and J. P. Benson.

The Cwmfelin Steel & Tin-plate Co., Ltd., has been registered with a capital of £200,000, to take over the business of the Cwmfelin Steel & Tin-plate Co., Ltd., incorporated in 1897, and the Swansea Steel Co., Ltd. The new concern will carry on the business of steelmaker, steel converter, tin and terne plate manufacturer, dealer in ironstone, iron, steel, coal, coke, clay, stone and other ores, metals and minerals, etc. The registered office is Cwmfelin Works, Swansea, Glamorganshire, England.

The output of iron ore from the mines of the Marbella Iron Ore Co., Ltd., during June, totalled 3,940 tons.

Miller & Co., Ltd., of the London Road Foundry, Edinburgh, are supplying chilled iron wheels and axles for wagons for the Bengal-Nagpur Railway.

The Delta Metal Co., Ltd., has recently erected large works and offices at East Greenwich, London, S. E., and their registered offices have been removed to the new works.

It is anticipated that the first shipments of Dunderland iron ore briquettes will be made at an early date, the railway and works being now almost completed.

Davy Brothers, Ltd., of the Park Works, Sheffield, are supplying two sets of engines for driving plate-rolling mills, and a large metal-mixer of 150 tons capacity, for the works of the Hang Yang Steel Co., of China.

The Sheepbridge Coal & Iron Co., Ltd., of Chesterfield, has just received a large order for 24-in. pipes for the Manchester Corporation. This company is also about to commence upon an extensive order for 20-in. to 30-in. pipes for the Derwent Valley Water Board.

The Cwmavon Iron Ore Co. has been floated at Cwmavon to carry on the business of steel manufacturers, the well-known firm of Messrs. Baldwins being the prime movers in the new industry. A cargo of 2,000 tons of ore is being shipped to Cwmavon.

To Manufacture Iron in South Africa.

A syndicate is reported to have taken preliminary steps to begin the manufacture of iron in Natal for local consumption. A grant of land has been secured for the purpose at Newcastle which is near the coal mining district. The intention, for the present is not to use ore, but to purchase scrap, of which there is an abundance in South Africa.

The American Car & Foundry Co. has received an order from the Missouri, Oklahoma & Gulf Railroad Co. for 50 gondola cars. The Pressed Steel Car Co. has received an order from the El Paso & Southwestern Railroad Co. for 500 side steel dump coke cars of 100,000 pounds capacity. The Chicago & Eastern Illinois Railroad Co. has ordered 26 cabooses. The Chicago, Rock Island & Pacific Railway Co. has ordered 25 cabooses. The Missouri, Kansas & Texas Railway Co. has ordered 14 simple mogul locomotives, eight simple locomotives and two balanced compound 10-wheel locomotives.

LOAN OF STEEL FOUNDRIES.

Two and a Half Millions to Pay for New Plants and Additions.

The American Steel Foundries has announced a plan which the directors have had under consideration for some time of issuing $3,500,000 of 6 percent bonds, secured by a first lien on the company's plants and stocks of subsidiary companies. The company is capitalized at $40,000,000, and has at the present time $471,000 bonds outstanding.

The bonds will be first offered ratably to the preferred and common stockholders at 80. A syndicate on a commission basis has been or is being formed to take such of the bonds, if any, as are not subscribed for by the stockholders. Many of the stockholders, including directors, are members of the syndicate. In the opinion of the directors the money to be raised on the bonds to be issued is necessary to meet the requirements of the company adequately. One million dollars of the money will be used to take up a loan which was recently made to pay a part of the consideration for the Simplex Railway Appliance Co., which cost about two and a half million dollars, and which is earning about $50,000 a month. The remainder will be used to pay for new plants and additions which have been built by the company since its organization and paid for from the working capital, and to supply the company with sufficient additional working capital to meet the demands of a largely-increased and increasing business.

The resignation of E. B. Thomas, president of the Lehigh Valley Railroad, from the directorate was announced later in the week. It is said that the resignation was tendered some months ago, although not made public until last week. It is also reported that Third Vice President W. V. Kelly has been chosen to succeed President Charles Miller, who will retire.

Trade Publications.

J. G. White & Co., Inc., 43 Exchange place, New York, have issued a bulletin entitled "Interurban Railway Construction." The bulletin is illustrated with several halftones showing various phases of interurban railway work as carried on by this company.

The Rapid Heater Co., Grand Rapids, Mich., has issued a catalogue describing the house hot-water heater made by it. The heater is of the water tube type, there being a central vertical drum, with the tubes radiating from it in a manner similar to those in a porcupine boiler.

The D. T. Williams Valve Co., Cincinnati, Ohio, is distributing a booklet illustrating the "Williams" regrinding valve. A number of different types are shown, including globe, angle, cross and check valves. They are made in all sizes from one-eighth to three inches.

Conway & Co., Cincinnati, Ohio, have issued a small catalogue describing their improved friction clutch. The clutch is made in all diameters, from eight to twenty-four inches, and with faces varying from three to six inches.

The Weir Frog Co., Cincinnati, has issued its catalogue No. 7. This is a cloth bound book, four by seven inches, and comprises nearly 400 pages, which are devoted to the description of frogs, switches, turnouts, crossings, switch stands, and other apparatus of interest to railway men.

About thirty salesmen of the American Steel Products Co., left New York City for Chicago and a trip up the lakes July 22.

TO AMERICA

Australia is Looking for Machinery, Especially for its Farms.

Toronto, Canada, July 24.—A. W. Jones, of Melbourne, Australia, director of a farming corporation operating an area of about 50,000 acres, was in Toronto this week in the course of a tour round the world. He stated that Australia was looking more and more to America for machinery, especially in the department of farm implements, one great reason being the slowness of British business methods. Almost every manufacturer of farming machinery both in the United States and Canada, had his agents in Australia, and competition among them was very keen. Australia did not manufacture agricultural machinery, owing largely to unsatisfactory labor conditions, which had retarded the country's industrial development.

The Keewatin Flour Mills Co. has contracted with the Macdonald Engineering Co., of Chicago, to erect at Keewatin a large milling and elevator plant at a cost approximating $750,000. Both buildings will be of steel-concrete construction throughout, the mill having a capacity of 5,000 barrels per day and the elevator a storage capacity of 500,000 bushels. The work is to be completed early next year.

The Montreal Metal and Hardware Association is agitating for the removal of the recently-imposed tax of $300 upon travelers representing foreign houses. A committee was appointed to wait upon the Provincial Government of Quebec and ask for the repeal of the law.

The Angus shops of the Canadian Pacific Railway at Montreal are very busy increasing the rolling stock of the road in preparation for moving the wheat crop of the West. During the last two months they have turned out nearly 1,000 box cars and are now producing them at the rate of 15 per day.

MILLION AND A HALF

Is Bond Issue of Central Iron & Steel Co., for Improvements.

Hamilton, Harrisburg, Pa., July 26.—The Central Iron & Steel Co. stockholders at a meeting at Harrisburg, Pa., on Thursday agreed to issue bonds to the amount of $1,500,000. The improvements to the plant will not be made for the present, President Edward Bailey stating that the plans were not matured.

The Middletown Car Works, which recently secured an order for cars for the Panama railroad and the Imperial Railways of Japan, has received an order for cars for the Cuban railways and the Ferre-Carril Centrale Norte, of Argentina. The company is erecting an addition to its plant at Middletown, Pa., which will be in operation about December 1. It now has work to its capacity for nine months.

The Harrisburg Rolling Mill Co. has started its finishing mill at Harrisburg, Pa., after an idleness of several weeks. The puddle mill has not yet been started.

The Eastern Steel Co. has started its plant at Pottsville, Pa., and the first runs have been successful. There are four 50-ton open hearth furnaces, billet and rolling mills. The large rolling mill will be ready within a few months.

The D. Wilcox Mfg. Co., of Mechanicsburg, Pa., has increased its capital stock to $150,000 and will make improvements. The company has elected these directors: R. H. Thomas, Aaron Buser, J. D. Landis, F. E. Wilcox, James Davis, J. H. Hollar, S. F. Houck.

STANDARD SPECIFICATIONS FOR STAYBOLTS.

Report of Committee of American Society for Testing Materials.

The committee on standard specifications for staybolts, submitted at the Atlantic City meeting, June 30, 1905, the attached specification as a tentative one, with the request that no definite action be taken upon same until the next meeting of the society.

The new features of the specifications are:

1. The method of manufacture is specified. This has been deemed advisable because experiments have conclusively proven that iron piled in this manner will give the best results in service.

2. A vibration test. It has not yet been proven that results can be duplicated in various machines, nor that the particular method employed in testing gives the most satisfactory results, but this test was specified as a basis for discussion and experiment in the hope that the members of the society most concerned with this matter would make experiments to definitely settle the advisability of vibratory tests, and the methods of making them.

SPECIFICATIONS FOR STAYBOLT IRON OF FROM 7/8 IN. TO 1 1/8 IN. IN DIAMETER.

No. 1. Process of Manufacture.

All iron staybolts must be hammered or rolled from a bloom or pile having a minimum cross-sectional area of 45 sq. in. and about 18 in. long.

The pile must be made up of a central core composed of bars of from ½ in. to 1 in. square, and be covered on all four sides with an envelope ⅝ in. thick.

This pile must be rolled to a billet, allowed to cool, again heated, and then rolled into bars of the required dimensions.

No. 2. Physical Tests.

a. Tensile strength not less than 48,000 lb. per square inch.

b. Elongation not less than 28 percent in 8 in.

c. Reduction of area not less than 45 percent.

d. Double bending test, close in both directions without flaw.

e. Threading; to permit of the cutting of a clear, sharp thread.

f. Vibration; shall stand a minimum of 6,000 revolutions when subjected to the following vibratory tests:

A threaded specimen, fixed at one end, has the other end moved in a circular path while stressed with a tensile load of 4,000 lb. The circle described shall have a radius of 3-32 in. at a point 8 in. from the end of the specimen.

No. 3. Inspection.

a. The iron must be smoothly rolled and free from slivers, depressions, seams, crop ends and evidences of being burnt.

b. It must be truly round within 0.01 of an inch and must not be more than 0.005 above, or more than 0.01 of an inch below specified sizes.

No. 4. Selection of Samples for Test.

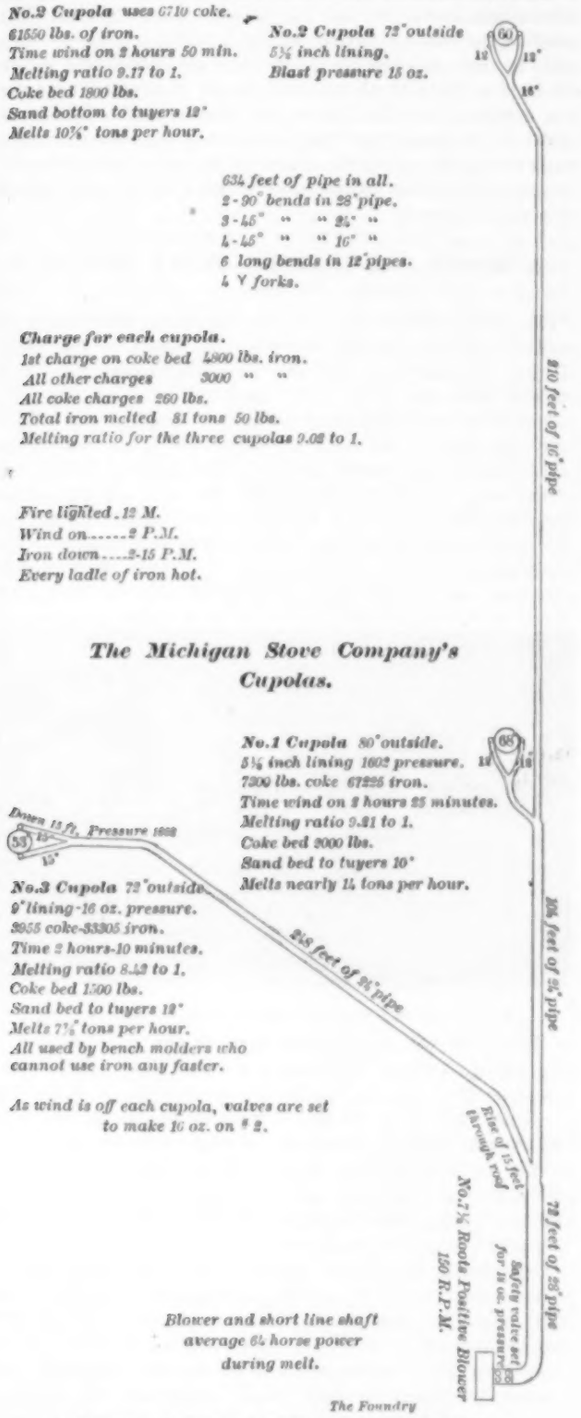
The bars will be sorted into lots of 100 bars each and two bars will be selected at random from each pile, failure of either of these bars to meet any of the above specifications will be cause for rejection of the lot which the tests represent.

The regular quarterly dividend of 1½ percent has been declared by the directors of the Crocker-Wheeler Co., manufacturer of electric motors and generators. At a meeting held in Ampere, N. J., the old officers were re-elected and reports showed the business of the firm to be in a satisfactory condition.

BLOWERS, PIPES AND CUPOLAS OF THE MICHIGAN STOVE CO.*

W. J. KEEP, DETROIT, MICH.

In describing this plant and the performance of the cupolas and blower, it is with the full realization that ideal conditions seldom exist, and that each man must fashion according to


No.2 Cupola uses 6710 coke.
61550 lbs. of iron.
Time wind on 2 hours 50 min.
Melting ratio 9.17 to 1.
Coke bed 1800 lbs.
Sand bottom to tuyers 12"
Melts 10⅞" tons per hour.
No.2 Cupola 72"outside
5¼ inch lining.
Blast pressure 15 oz.
60
12"
12"
16"
634 feet of pipe in all.
2-90° bends in 28"pipe.
3-45° " " 24" "
4-45° " " 16" "
6 long bends in 12"pipes.
4 Y forks.
Charge for each cupola.
1st charge on coke bed 4800 lbs. iron.
All other charges 3000 " "
All coke charges 260 lbs.
Total iron melted 81 tons 50 lbs.
Melting ratio for the three cupolas 9.02 to 1.
Fire lighted 12 M.
Wind on.....2 P.M.
Iron down....2-15 P.M.
Every ladle of iron hot.
210 feet of 16"pipe
The Michigan Stove Company's Cupolas.
No.1 Cupola 80"outside.
5¼ inch lining 16oz pressure.
7300 lbs. coke 67225 iron.
Time wind on 2 hours 25 minutes.
Melting ratio 9.21 to 1.
Coke bed 2000 lbs.
Sand bed to tuyers 10"
Melts nearly 14 tons per hour.
68
12"
12"
Down 15 ft. Pressure 16oz
53
15"
15"
No.3 Cupola 72"outside.
9"lining-16 oz. pressure.
3955 coke-33305 iron.
Time 2 hours-10 minutes.
Melting ratio 8.42 to 1.
Coke bed 1500 lbs.
Sand bed to tuyers 12"
Melts 7½" tons per hour.
All used by bench molders who cannot use iron any faster.
248 feet of 24"pipe
306 feet of 24"pipe
As wind is off each cupola, valves are set to make 16 oz. on # 2.
Rise of 15 feet through roof
No.7½ Roots Positive Blower 150 R.P.M.
Safety valve set for 20 oz. pressure
72 feet of 20"pipe
Blower and short line shaft average 64 horse power during melt.
The Foundry

GENERAL LOCATION OF PIPE LINES AND CUPOLAS.

his needs. An independent blowing unit for each cupola with short piping, is an arrangement we would like to have, but which only a favored few possess.

In our case, the piping from the blower has been extended to meet the growth and increased demands of our plant, until now we have three cupolas operated by one blower, under the following conditions: Starting at the blower end is a No. 7½ Roots' blower, running at 150 r. p. m. From there the air piping is carried overhead by two 90-degree bends in a 28-in. line, 72 ft. to a point where it branches with a Y into two 24-in. lines, one running 248 ft. to cupola No. 3; the other 104 ft. to cupola No. 1. From No. 1 with a Y branch begins a 16-in. line running 210 ft. to No. 2 cupola. All bends are long radius, and wind boxes are supplied by two pipes on opposite sides, starting from a Y on the main line. The sketch shows the general location of the pipe lines and cupalos. would furnish it.

There are butterfly valves in line at cupolas Nos. 1 and 3, so that cupola No. 2 may not be short of wind, and which are also opened to allow surplus air to escape when cupola No. 2 is operated alone. No. 3 is the point where the least air is needed and is where most of the throttling down occurs, because this cupola serves a snap flask shop, which cannot take care of the iron as fast as the normal operation of the cupola would furnish it.

As No. 3 cupola seldom operates over two hours, and with a very small heat, it is run at a disadvantage and cuts down the average efficiency of the entire plant.

In most of the data the results are for the plant as a whole, and while this shows unfavorably for Nos. 1 and 2, it represents the actual working conditions liable to occur in almost any large plant.

We find that our best results are obtained with a blast pressure at the cupola at from 16 to 18 ounces, for we get our fastest melting under those conditions, without sacrificing economy of operation. In order not to exceed 18 ounces a relief valve is placed at the blower to lift at that pressure. We have tried higher pressures and have found that with from 22 to 26 ounces there was no increase in the melting rate, as the chilling effect of excess air nullified the advantage of increased blast pressure. Up to 22 ounces there was a decided increase of output, but the best results were with a blast of 16 or 18 ounces.

The losses from friction in the piping are ½ ounce to No. 3, ¾ ounce to No. 1 and 1¼ ounce to No. 2. At the beginning of the heat only Nos. 1 and 2 are on. Later No. 3 is started up and the pressure falls as low as 14 ounces at No. 2. This condition does not last for more than half an hour, when the pressure runs up to 15 ounces at No. 2 and 16 ounces at Nos. 1 and 3, at the end of the heat, with the dampers, this cupola getting 16½ ounces and melts very fast. The following is the record of an 81-ton heat in the fall of 1904 when the foundry was running to its full capacity:

AN 81-TON HEAT IN 1904.

Cupola	Outside Diameter	Inside Diameter	Coke Used	Iron Melted	Ratio Iron to Coke	Length of Heat	Tons Melted per hour
No. 1	80"	68"	7300	67225	9.21 to 1	2h—25m	14
" 2	72"	60"	6710	61550	9.17 to 1	2h—50m	10⅛
" 3	72"	53"	3955	33305	8.42 to 1	2h—10m	7⅛

Totals, 81 tons 50 lb. iron. 32.75 tons per hour. Ratio 9.2 to 1. Air displaced by blower per ton per hour 22,800 cu. ft.

For stove plate it requires close attention to avoid dull iron when the ratio is above 9 to 1, and the following are average records. When more coke is burned melting is slower:

A 75½-TON HEAT IN FEBRUARY, 1905.

Cupola	Coke Used	Iron Melted	Ratio	Length of Heat
No. 1	6900	63430	9.0 to 1	2h—55m
" 2	6450	59250	9.2 to 1	2h—55m
" 3	3040	28270	7.8 to 1	1h—50m

75 tons 950 lb. iron. Ratio 8.86 to 1. Air 25,380 cu. ft.

*Read at the American Foundrymen's Association meeting, New York city, June 6-8, 1905.

1905	March 1	March 2	March 4
Total Coke Used	16950	16970	16660
Total Iron Melted ..	75 tons 10 lbs	74 tons 1740 lbs	73 tons 190 lbs
Ratio Iron to Coke..	8.8 to 1	8.8 to 1	8.7 to 1
Tons Melted per hr	28.8 tons	28.07 tons	28.00 tons
Cu. ft. of Air per Ton per hour.....	25500	26400	26400

On March 8, 1905, on account of a funeral of one of the employes, No. 1 cupola was run alone with an air pressure of 17 ounces.

The molders could not pour fast enough to take the iron as fast as melted and it was therefore necessary to reduce the blast at times. Under these conditions 33 tons 960 lb. of iron were melted at the rate of 13.4 tons per hour with a ratio of 9.2 to 1.

As the average of the last four heats in No. 1 cupola was 11 tons per hour, the increasing of the blast 1½ oz. has increased the melting 20 percent.

HORSEPOWER REQUIRED TO DRIVE THE BLOWER AT VARIOUS PRESSURES.

Pressure at Blower	Indicated Horsepower to drive Blower	Theoretical Horsepower to drive Blower	Per cent Efficiency of Blower	Friction
13 ounces	50 I. H. P.	45.23	90.4	6.9
18 ounces	72 "	62.48	92.0	8.0
23 ounces	87 "	80.00	87.0	13.0

The engine was indicated by an expert. 18 ounces at the blower would produce the normal pressure at each cupola.

The friction of a short countershaft and belt are included in these figures. As the relief valves of our blower are set for 18 ounces and our pressure varies from 13 to 18 ounces, it is fair to assume 64 as the average horsepower consumed during one melt. As the tonnage with three cupolas is 28½, the horsepower per hour required under our conditions is $64 \div 28\frac{1}{2} = 2.25$, and the air displacement per ton of iron per hour is 26,220 cu. ft. per hour, instead of 30,000 cu. ft., as usually allowed.

As a pound of carbon requires about 11 lb. of air for combustion to CO_2 and 13 cu. ft. of air equals one lb., therefore one lb. of coke should require 143 cu. ft. of air. The coke averages about 5,650, requiring theoretically 28,500 cu. ft. of air per hour.

Wishing to know what the makers would recommend for our work, as the most economical installation, we find, in spite of our long pipes, and air actually wasted, when Nos. 3 and 1 are shut down, that we are still well within what would be ordinarily expected in an ideal arrangement of independent blowers and motors for each cupola, with consequent decrease of pipe friction.

The makers recommended as follows:

Cupola Blown	Cu. Feet Air Displacement per Minute	Horsepower	Tons
No. 1	7000	30.5	14
" 2	5400	23.5	10¾
" 3	4000	17.5	7⅞
Total.....	16400	71.5	32¾

Allowing 20 percent for friction of blower and motor, we get 90 horsepower, or 2¾ horsepower per ton, against 2¼ actually required.

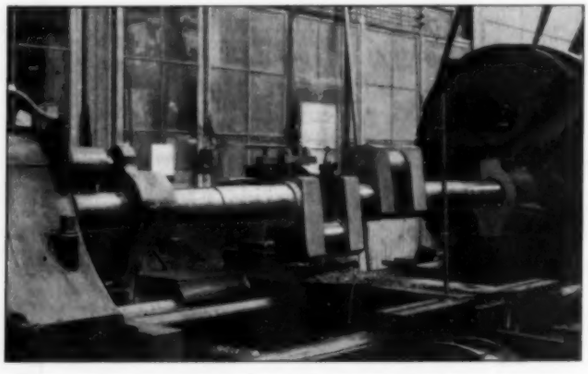
One the above basis of air the friction losses figure out one ounce to No. 1 cupola, 3.1 ounces to No. 3, and six ounces to No. 2. On an allowance of 24,000 cu. ft. per hour per ton of iron the friction to No. 1 cupola is 0.9 ounces, to No. 3 0.55 ounces, and to No. 2 cupola is 2.50 ounces.

The actual loss as stated before is from ½ to ¾ of an ounce to Nos. 1 and 3. It is from 1¼ to 1½ ounces to No. 2, showing that our piping is of correct size to Nos. 1 and 3 but too small to No. 2. It would be better to continue the 28-in. pipe to the fork at No. 1 and make it 20 in. or 24 in. to No. 2.

The data presented here represent as near as possible actual running conditions, and our plant could be improved upon by independent units for each cupola with shorter piping, thus avoiding the waste of air when Nos. 1 and 3 are down. This could be done by reducing the speed of the blower, but as we are fixed we have to use constant speed. However, as we are now getting iron as hot and as fast as we wish it, there is no object in increasing the blast pressure. We would be very much interested to have the records from a plant where the arrangement is similar to ours, and where a fan is used instead of a rotary blower.

A DEVICE FOR TURNING CRANK SHAFTS.

The device shown in the accompanying illustration is used for turning double throw crank shafts at the plant of the Westinghouse Co., at East Pittsburg, Pa. The shaft is first placed upon the lathe centers and the ends and central bearing turned, or rather roughed out. Two cast iron fixtures are next placed in the lathe, one being bolted to the face plate, and the other secured to the end of the shaft with set screws. In the case shown in the illustration the cast iron fixture at the outer end of the shaft fits down against the collar. The tail center of the lathe is then run forward enough to enable the shaft to clear the tail stock. By arranging the tail stock fixture



A DEVICE FOR TURNING CRANK SHAFTS.

in line with the cranks and placing the dead center in one side as shown, the work is brought into proper position for finishing one of the cranks. When it is desired to finish the other crank the clamps on the head stock fixture are loosened, blocking introduced under the work, or the work suspended from a crane, while it is turned in the face plate fixture. This brings the other center of the tail stock fixture opposite the dead center and allows the other crank to be finished.

One crank is usually roughed out, the work shifted to the other position, and the second crank roughed out. This crank is then finished, the work shifted back and the second crank finished. After this the work is returned to the regular shaft centers and the shaft and central bearings finished. It is necessary to place a heavy counterbalance weight on the face plate to balance the face plate fixture and the shaft.

An invention of R. A. Hadfield to increase the toughness of steel, especially nickel chromium steel, whether containing tungsten or not, has been accepted by the Patent Office.

HOT CRACKS IN STEEL CASTINGS.

BY ARTHUR SIMONSON.

An attempt will be made in the following article to outline the principal causes of one of the greatest difficulties that a steel founder has to contend with, and to suggest some means by which it may be overcome, at least partially. Cracks in steel castings are of two kinds, which differ in their appearance and cause very materially. Hot cracks take place at the time of solidification of the metal or very soon after; cold cracks are formed while the metal is below red heat. The former take the appearance of a tear, are very ragged and there is a sinking of the metal at the edges; they are generally quite wide and have a film of blue or black oxide on their fractured surfaces. Cold cracks, while they may be open occasionally, are generally very fine, clean cut as with a knife, and unless the castings are carefully inspected may sometimes escape observation. Ringing the castings with a hammer will often reveal the presence of cold cracks, which are almost invisible. It is with the former, or hot cracks, that the present article is intended to deal.

The two principal causes of hot cracks are obstructions to the free contraction of the metal, and unsuitable composition of the metal itself. First, then, look into the causes which may prevent the unrestricted contraction of the metal. They are chiefly the rigidity of the mould and the varying thicknesses of section of the casting. The mould has to be made sufficiently strong to stand the weight of the steel and the fluid pressure of the head of metal, while it is being poured. Moulds for steel castings are generally made in dried sand, which consists of silica sand mixed with a certain proportion of clay to bind it together. And though it is very weak in its green or damp condition, it becomes quite hard and firm after baking. The moulds are faced with a wash made of silica flour and molasses water, which gives a very hard, refractory skin. It is therefore important that while the mould should be strong enough to stand all the pressure it is to receive, it should not be any stronger than is necessary for the above purpose. Means may be provided for making the mould stronger in some parts than others, for instance near the gate, where the cutting action is greatest. At these places the mould may be made of a stronger grade of sand, or if its shape allows, hard cores or firebricks cut to shape may be fitted in, to take the wear of the stream of metal. All square corners, both inside and outside, should be amply filleted, and wherever a rib or a projecting arm of the pattern protrudes, the sand in its immediate vicinity should be loosened up by ramming in cinders, sharp sand or sawdust; or the mould can be cut away to within two or three inches of the pattern, after it has been dried, and the space filled in with burnt sand.

Another point to be attended to with the idea of reducing the danger of hot cracks is the drying of the moulds. To produce the best results a mould should be rather over dried than under dried, that is to say, it should be almost but not quite burned. A mould that is only just dry is in the most rigid possible condition; it can be baked a good deal more and yet preserve sufficient strength to stand the wear and tear of pouring, and it will then offer much less resistance to the shrinkage of the metal. The ideal mould, as has been said before, consists of a hard refractory skin and a collapsible backing, which will give way as soon as the cooling skin of the casting has become sufficiently rigid to support itself, and begins to shrink. It is to the production of these conditions as nearly as may be possible in practice that foundrymen have to bend their efforts.

Defective construction of cores is another fruitful source of cracked castings. Coremaking is a branch of the steel foundry trade that does not receive the attention it merits. It is equally as important as the mould itself, calls for as much skill and contributes equally to the success or failure. And yet we often find the coremaking relegated to a very secondary place. Core sand mixtures should be as carefully studied as moulding sand mixtures, and a great saving may be effected, not only in the matter of cracking, but in the cost of cleaning and the soundness of the castings by careful attention to this point. The same description applies to a core as to a mould—it should have a hard, smooth face, which will resist the cutting and fusing action of the metal, but it should crumble and fall out in the form of a powder when burnt. Careful handling will permit the use of cores which seemingly are exceedingly delicate. As the writer has previously stated, cores can be made of almost anything provided the wash is all right. When the core is rammed up it should have a good coat of a wash made of silica flour, ceylon graphite and molasses water, and then put in the oven and baked until after scratching the skin the inside is thoroughly "rotten." Then another coat of wash, or two if necessary, may be given, and the core is re-dried. It is surprising how strong this skin becomes, and it is no more than one thirty-second of an inch thick.

In a great many cases a core has to stand much greater pressure than the mould itself, as for instance in a pipe or cylinder, where the metal is shrinking on the core from every direction. If the core is not collapsible one of two things must happen—either it will crack the casting or the core will become so hard that its removal will be a very expensive and lengthy operation.

The second point, namely the composition of the metal itself, is equally important with the foregoing. Any conditions which tend to hot shortness of the metal, which means brittleness above red heat, must be carefully avoided. The two principal elements found in common practice which have this tendency are sulphur and copper, and while their influence is not very great in the cold state of the steel, still, as the metal has to pass through the hot short period before cooling to the ordinary temperatures, it is important they should be kept as low as possible. Either of them by itself is dangerous, but the combination of the two is fatal. As a large proportion of Eastern iron is made from ores from the Cornwall district, a great deal of the scrap available as well as the iron, has an appreciable content of copper, and it is therefore necessary to watch the sulphur most carefully, and care should be taken not to allow it to run over 0.045 percent. This is done by selecting melting stock as low as possible and running a high manganese, which will prevent increase of sulphur from the coke, etc., and tend to reduce it, if anything, by the formation of sulphide of manganese.

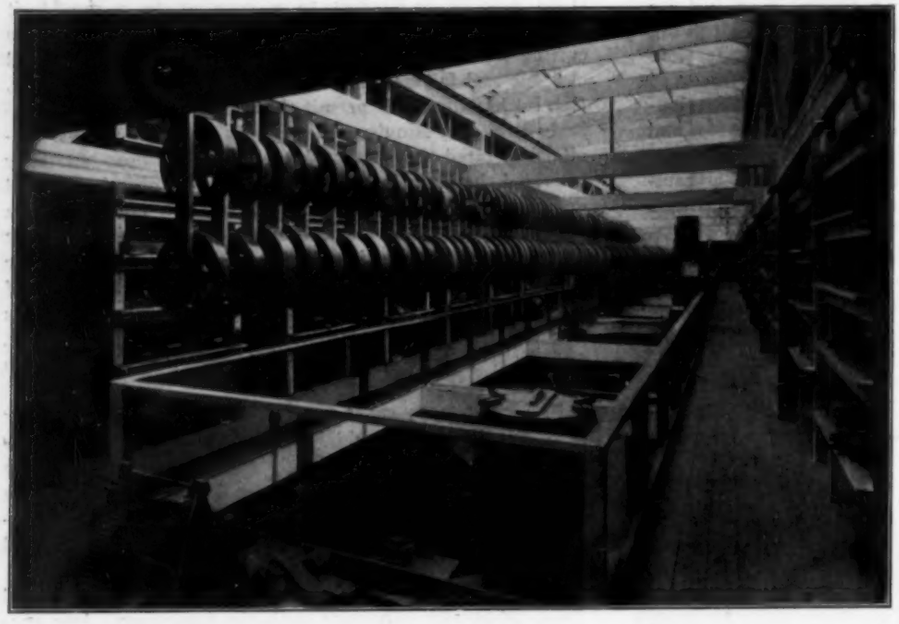
A New Tool Steel.

The Sheffield Steel Makers, Ltd., Sheffield, England, are putting on the market a new kind of tool steel, known as "Unor." The cutting and wearing capacity of this steel, it is claimed, ranges between that of the old type of self-hardened steel and the best of the modern high-speed steel. "Unor" is sold at a price below that usually charged for rapid-cutting tool steel. Besides the "Unor" steel the Sheffield Steel Makers, Ltd., are exploiting a new tool steel which is intended to maintain a cutting edge longer than anything of the kind yet produced.

CARE AND STORAGE OF PATTERNS.*

BY H. M. LANE.

One of the most serious problems that confronts any manufacturing concern is the storage of patterns and the records for the same. All patterns are to be divided into two classes: wood and metal. If the concern uses metal patterns entirely the storage can be much simplified, as the metal patterns can be easily protected against fire loss, and hence the storage of this class of patterns will be considered first.



A GOOD METHOD OF STORING GEAR PATTERNS. WELLMAN-SEAVER-MORGAN ENGINEERING CO., CLEVELAND, O.

Metal patterns are, as a rule, of comparatively small size. Very small or thin patterns, which are used in connection with match plates, can be stored in fireproof vaults or rooms. Very frequently, however, wooden shelving is used in such vaults, though when possible it is always to be avoided. Very strong, and not exceedingly expensive shelving can be made up from light angle iron and sheet iron. It is needless to say that the pattern vault should always be kept dry for the protection of patterns, and under such conditions the iron shelves and supports would last almost indefinitely. A vault of this kind having fireproof walls, roof and door, and provided with metal shelving, is undoubtedly the best possible arrangement. To cheapen the arrangement somewhat, many have substituted wooden shelving for metal shelving. If the vault is thoroughly fireproof and there is no opportunity for the shelving to be set on fire, such a vault is certainly very valuable; and it is probable that the risk of fire from the shelving is almost a negligible factor.

To still further reduce the cost of the storage some manufacturers have located the storage in a building apart from the other structures, and arranged with no windows in the side walls. The shelving is of wood and the roof of some slow-burning construction, usually covered with slate or metal. Light is obtained from skylights in the roof. Such an arrangement as this is undoubtedly a great protection, but care should be taken not to store combustible materials in the vault, such as alcohol, gasoline, etc., as the ignition of a can of such material might destroy the contents of a vault in a very short time. If no such building is provided for the metal patterns the storage shelves should be so arranged that they can be readily protected by a fire-fighting apparatus, and they should also be located in some part of the plant where the fire risk is a minimum.

As a rule, where metal patterns are used in stove plate, hardware and similar factories, the patterns with their matches do not take up much space, and hence a very large number can be stored in a comparatively small space. Where special molding machines, equipped with large patterns are used, it becomes necessary to provide stronger and larger shelving, and in some cases the large

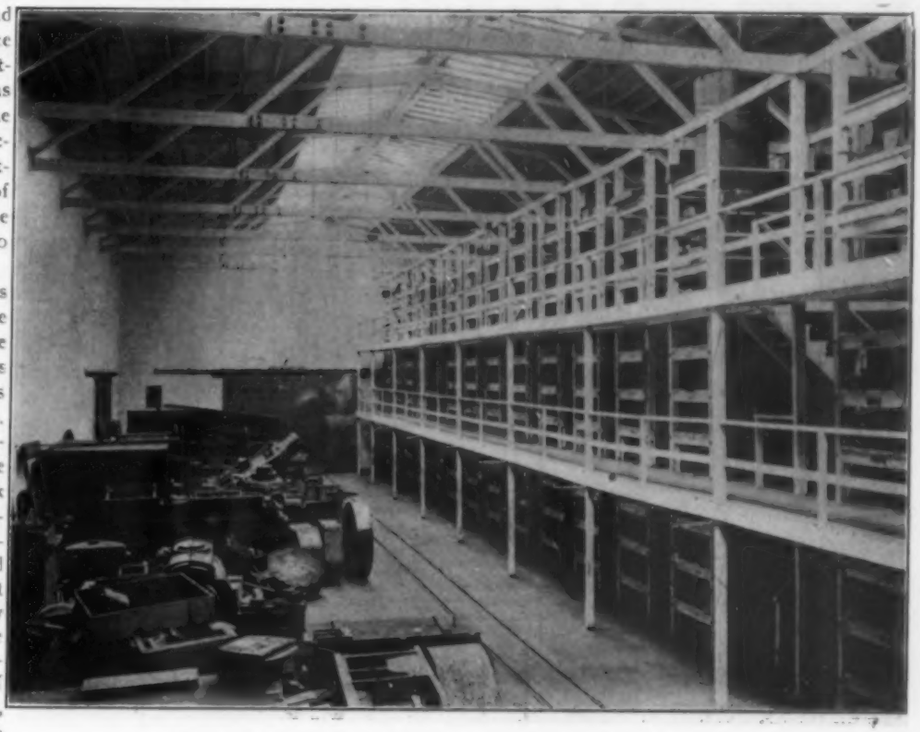
VAULT FOR METAL PATTERNS WITH WOODEN SHELVING AND SKYLIGHT IN ROOF, INTERSTATE FOUNDRY CO., CLEVELAND, O.

*A paper presented at the convention of the American Foundrymen's Association, New York city, June 6-8, 1905.

pieces must be kept on the floor of the storage building.

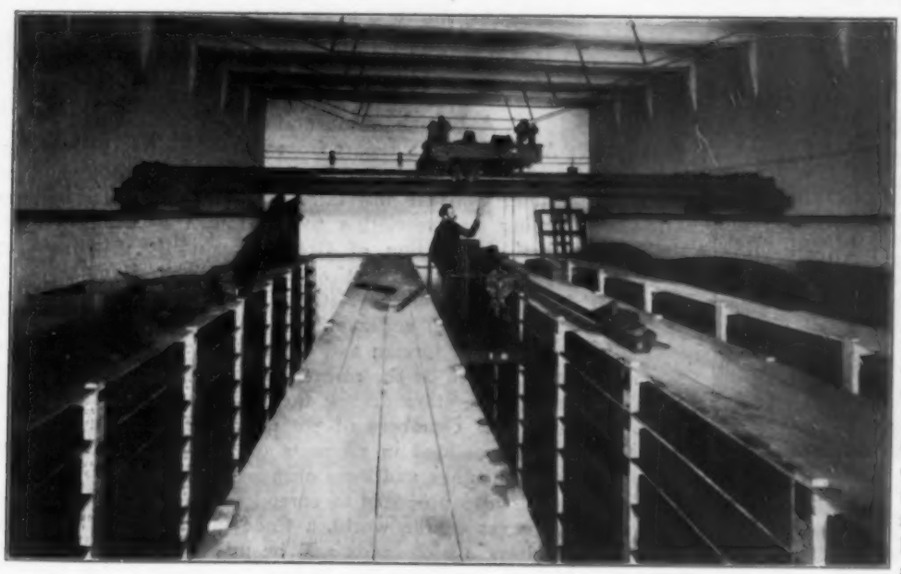
In the storage of wood patterns, several very different factors enter to complicate the problem. First, the patterns themselves are highly inflammable; second, wood patterns are usually very much more bulky than metal patterns, and hence require larger space in the storage; third, wood patterns absorb moisture during molding to a greater or less extent, and if they are then placed in a cold storage room, in the winter moisture freezes and injures the joints and surface of the pattern and hence a pattern storage for wood patterns should be provided with some heating system. It is also necessary to heat the metal pattern storage for the benefit of the man who takes care of the patterns, as no man can do work in a cold room.

In the case of wood patterns all that can be done in the construction is to minimize fire risk. Different parties have taken different methods for accomplishing this. Among the methods of construction of pattern storage buildings in regard to fire risk the following may be considered: First, in regard to protection there are the individual room and the individual vault systems. In the first ordinary pattern shelving is used, the rooms are provided with fireproof floors, the windows, if any, with fireproof shutters, and the doors with self-closing fireproof doors; these doors are held open with cords and fusible plugs or couplings which would be released very quickly if exposed to any heat. The object in this system is to prevent the fire's spreading through the entire storage and to, as far as possible, smother the fire in the compartment in which it breaks out. This system is generally used in connection with the sprinkler system. Of necessity the pattern shelving is not very high in such a storage room, on account of the fact that the patterns are all placed in position by hand from short ladders, and hence the individual units are rooms from 60 to 100 or more feet in length, usually from 60 to 80 or more feet wide and from 15 to 20 feet in height.



PATTERN STORAGE WITH LIGHT WOODEN ROOF AND SKYLIGHTS, BUFFALO FOUNDRY CO., BUFFALO, N. Y.

In the other system the individual rooms or units are made narrow but very high; a crane is used for placing the patterns into or taking them from the storage, the crane being arranged to travel over the entire room so that the operator may carry his cage or platform in between any of the sets of shelving, and thus reach any point of the storage system. Such rooms can be made practically air tight; the ventilators at the top being provided with covers suspended by fusible couplings which are dropped at the least indication of fire. In this style of storage the sprinkler system would be of little avail.



TOP OF PATTERN SHELVING SHOWING CRANE WITH CAGE ON HOIST, INDIVIDUAL VAULT SYSTEM BROWN HOISTING & CONVEYING MACHINE CO., CLEVELAND, O.

In both the systems so far described every possible precaution is taken to enable those in charge to extinguish a fire, should one start; usually, however, these buildings are arranged for the use of artificial light, which in most cases is furnished by the use of incandescent lights. Such wiring naturally introduces fire risk. To minimize such fire risk and at the same time to reduce the labor of placing

the patterns on or removing them from the shelving, at least one prominent manufacturer has constructed a pattern storage using slow-burning mill construction and having a head room of not to exceed eight feet, so that a man standing on the floor could reach any of the shelves.

To minimize fire risk no artificial lights of any kind are allowed in the building, and all patterns are taken into or out of the storage during the day.

INDIVIDUAL ROOM SYSTEM OF PATTERN STORAGE WITH SLOW BURNING CONSTRUCTION AND FIRE WALLS, GENERAL ELECTRIC CO., SCHENECTADY, N. Y.

Other manufacturers have sought to minimize the fire risk in many ways. In some cases the inflammable character of the material has been recognized and only a thin wooden roof of light construction used; the idea being that such a roof would burn off quickly and give free

SHELVING AND DRAWERS FOR THE STORAGE OF SMALL PATTERNS.

access to the fire for the firemen. A large number of pattern storages have been contructed one or two stories is height, without any outside windows; all of the light being derived from a skylight; the idea being that the lower part of the building could be shut up tight and a fire smothered out. The particular form of construction of the building must of necessity depend largely upon the means of the company owning the plant, and where sufficient capital is not available it is often necessary to use the simplest kind of frame structure. There is no place about a manufactory where there is such an opportunity to display fads or ride hobbies as there is in connection with the care and storage of patterns, and it requires good judgment and careful planning to be sure that the best system is installed. There are a few points in connection with the subject of pattern storage, however, which may be called axioms.

First, no matter how many men are allowed to take patterns from the storage, only one man should be allowed to return them and he should be held responsible for every pattern. Second, where only a limited number of small or medium-sized patterns have to be cared for it is foolish to install any hoist or elevator system for handling patterns, as in most cases the attendant has ample leisure to put them away, and in many cases he can carry them upstairs cheaper than they could be taken up on an elevator, which would ordinarily stand idle 99 percent of the time.

Third, whatever system is in vogue, some provision must be made for taking care of the dead patterns; in other words, there must be a graveyard.

Fourth, wood patterns must never be stored where they are subject to rain or snow, or even where they are subject to freezing temperatures. The reason for the latter statement is that moisture in the surface of the pattern will be frozen and injure the surface or finish. This freezing will also often open the joints.

A British Manufacfurers' Association.

According to a report from United States Consul Taylor, from Glasgow, Scotland, the manufacturers of Great Britain, who are interested in the export business, are forming an association to be known as the Manufacturers' Association of Great Britain. It will have an object similar to that of the Canadian Manufacturers' Association, and the National Association of the United States. It will endeavor to promote and expand British trade in the foreign and colonial markets. This will be accomplished by the co-ordination of the industrial forces and co-operation among the leading manufacturers and merchants chambers of commerce. Correspondents are to be appointed in all parts of the world to report on trade openings and local changes and conditions.

It is also proposed to compile in the chief commercial languages of the world, a trade index of British manufacturers, which index will be distributed free to chambers of commerce and leading merchants in the colonial and foreign markets. Information regarding the standing of any firm, and regarding railway and shipping rates throughout the world will be collected and supplied. A staff capable of corresponding on technical and commercial subjects in any language will be organized.

RAIL SECTIONS AS ENGINEERING STRUCTURES.

BY P. H. DUDLEY.

The mechanical properties, as stiffness and strength of a section, increase in a rapid ratio as the height is augmented, as shown by Table No. 1.

Table No. 1.

Weight of Section in lbs.	Height in Inches.	Width of Head.	Moment of Inertia 4th power Inches.	Moment of Resistance Cubic Inches.
60	4.0	2¼	12.0	6.7
65	4.5	2⅜	16.0	7.8
80	5⅛	2 21-32	28.5	11.4
100	6.0	3.0	48.5	16.6

The 80 and 100 lb. sections become more efficient engineering structures than the 60 and 65 lb. which they replaced, by inducing a longer distribution of the passing wheel loads to the cross-ties and ballast, and lessening the deflection under the wheels. A greater portion of the wheel effects is absorbed by the constraining negative bending moments in the wheel spacing, reducing the positive moments under the wheels. This favorable action for a smoother running surface in the general depression under the wheels, however, increases the wheel contact pressure intensity per square inch in the bearing surface of the section, and imposes a greater burden upon the metal of the entire head.

The stiff sections for a given unit fiber strain carry larger bending moments than the limber rails and therefore are more efficient engineering structures for heavier axle and total loads.

Table No. 2.

Positive Bending Moments in inch-pounds for the given unit fiber strains per section in Table No. 1.

Section.	10,000 lb.	20,000 lb.	30,000 lb.	40,000 lb.
60 lb.	67,000 I. lb.	134,000 I. lb.	201,000 I. lb.	268,000 I. lb.
65 "	78,000 "	156,000 "	234,000 "	312,000 "
80 "	114,000 "	228,000 "	342,000 "	456,000 "
100 "	166,000 "	332,000 "	498,000 "	664,000 "

In the 80 and 100 lb. sections nearly the given maximum moments have been obtained in tests.

Unit fiber strains in tension from .0 to 30,000 lb. are those which occur daily under present locomotives, with some strains of the higher figures and liable from a flat wheel to be exceeded.

Large unit fiber strains have been common since steel has been used for rails, for the limber sections had frequent sets, which indicated they were strained beyond their elastic limits. Under 65-lb. rails in a yard track a unit fiber strain has been measured of 56,000 lb.

The elongation for the strains in Table No. 2 would be 0.00034, 0.00067, 0.001, and 0.00134 of an inch, respectively, for the modulus of steel at 30,000,000 lb., summer temperatures, though higher for winter.

The height of the section is increased to augment the mechanical properties of stiffness and strength. This has a tendency to reduce the unit fiber strains in the base of the rails, but the subsidence of the road bed under the wheel loads, the looseness of the cross-ties in the ballast, and of the rails under the spikes, cause the bending moments, carried by the stiff rails, to exceed those carried by the limber sections for the same wheel loads, though the percentage distributed per individual cross-tie is less. This increases the intensity of the wheel contact pressures in the bearing surface. The wheel loads also have been doubled on the stiff rails, over what they were on the light sections, and the metal in the bearing surface therefore sustains two and three times the burden required by the former limber sections.

The metal in the rail section has three functions to perform, viz., to receive, to support and to distribute the wheel loads of the passing trains. The metal in the bearing surface sustains its loads principally by its properties of cubic elasticity, and should be sound and homogeneous. The side of the head resists abrasion of the wheel flanges by its toughness and tenacity. To distribute the loads by the entire section its linear elasticity is exercised.

The factor of safety in the girder determines what physical properties may be used for the bearing surface and guide. A distortion of the rail head in service shows that the steel has low limits of cubic elasticity, and is not homogeneous. This is shown by Figs. 1 and 2.

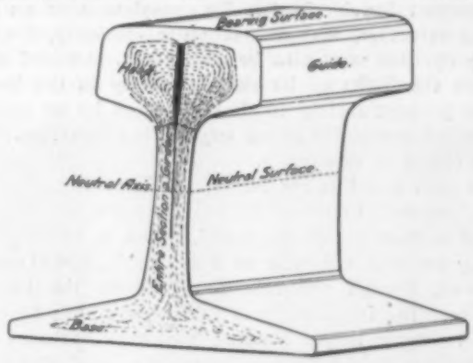


FIG. 1.—RAIL SECTION FROM THE UPPER PORTION OF INGOT, SHOWING A CENTRAL CORE OF METAL IN WHICH BY LIQUATION THE METALLOIDS IN THE STEEL ARE ABOVE THE AVERAGE.

When the steel is solid, sound and of fine texture, the head does not become distorted under service, though it wears on the bearing surface and on the side. When the ingot is unsound and spongy, the head flattens and crushes under the wheel loads. In rails made of steel taken from the top of the ingots, where, by liquation, there is a higher percentage of carbon and phosphorus, the central core of metal is not sound and strong, but fragile, and does not sustain the wheel contact pressures as well as the exterior portion of the section. See Fig. 1.

FIG. 2.—DISTORTED RAIL SECTION OF POROUS, COARSE GRAINED STEEL. THE CHECK IN THE HEAD DEVELOPED UNDER SERVICE.

When a decided pipe in the ingot does not occur in cooling, the repeated pressures of the wheel contacts develop a check which is equivalent to a pipe, and as the metal immediately over it in the bearing surface stretches sidewise by its linear elasticity, the check widens until a portion of the head becomes detached from the web of the rail, as in Fig. 2. The steel in the head is not homogeneous, either in quality or structure, and becomes distorted as a section, from inadequate physical properties of its elasticity of volume, to sustain and distribute the wheel loads.

The splitting of the head in the earlier steel rails was

* Abstract of a paper presented at the eighth annual meeting of the American Society for Testing Materials, Atlantic City, N. J., June 29-July 1, 1905.

in nearly all cases traced directly to a pipe in the ingot. These conditions still exist, yet there are numerous instances in which the pipe did not develop in cooling, but has developed in service in the unsound metal of the central core of steel. Pieces break from the side of the head, in steel where so decided liquation has occurred in the ingot as to make two or more grades of steel in the rail head.

By the design of the section for a given weight, its mechanical properties have been increased, enabling it to transport heavier loads. To complete it as an engineering structure, with the requisite efficiency, the physical properties must also be augmented, in sound metal, to raise the limits of its cubic elasticity in the bearing surface proportionately to those required by its enlarged mechanical properties as an engineering structure. This is a problem of mechanics.

Iron rails failed in the bearing surface when the wheel loads increased to 10,000 lb. owing to the low limits of the cubic elasticity of the metal. Two or three percent of slag made it a bundle of fibers, only, for the wheel pressures, though adequate to distribute the loads as a girder. Increased stiffness in the iron rails to enable them to carry larger bending moments hastened their destruction.

In the limber steel rails first rolled, the grain or texture of the metal was fine and compact. The elastic limits in reference to its cubic elasticity were high, and it could sustain the wheel contact pressures without distortion. The conversion of the steel was less rapid, the ingots smaller, and liquation was slight. The present conversion, in larger vessels, teemed in larger ingots, which are not as sound, for the entire length, as the smaller ingots. The tendency of the upper portion is to form a pipe or become porous. The longer time in cooling allows the metalloids to separate from the bath and become concentrated in an upper central core of the ingot. This does not produce homogeneous metal in the head. It is not capable of sustaining the wheel contact pressures by its cubic elasticity, and fails more rapidly in service.

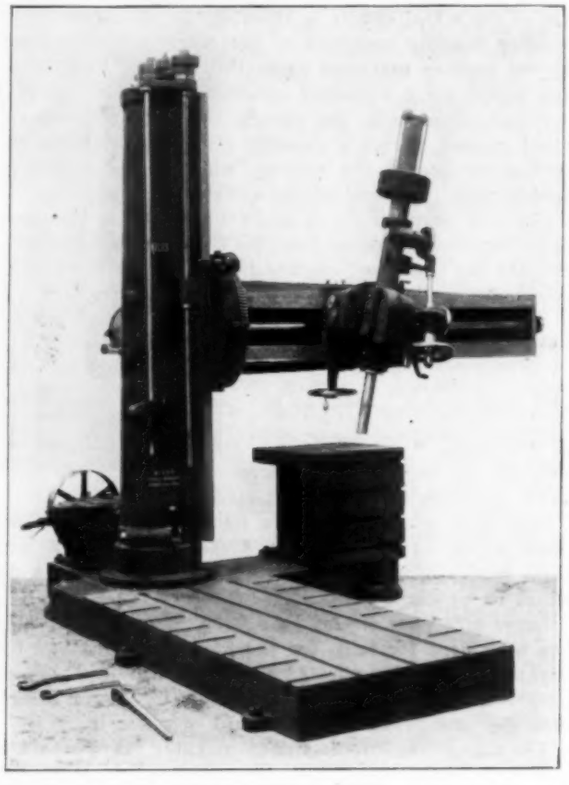
The steel in the rail section should be sound and have sufficient physical properties and rigidity of structure to preserve the shape of the section under traffic, excepting the loss by wear of the wheel treads in the bearing surface, and by the wheel flanges on the side of the head. Sound metal of 56,000 or more granulations per square inch, and elastic limits of 56,000 to 60,000 lb., has sustained the present wheel loads without distortion of the heads. The facing ends of the rails should not flatten in sections having moments of inertia of more than 25^4 inches. More limber sections are not fished securely enough to prevent the wear of the facing ends of the rails under the shocks of the present wheel loads.

I have under observation rails made at several different mills and in those without effort made to control or check liquation, the splitting and the piping of the rail heads is pronounced. In rails rolled from metal where attention was paid to checking liquation, the piping and splitting of the rail heads is practically unknown. The problems of checking liquation in large ingots are not always easy of solution and must be solved with reference to the practice of each mill.

The metal for the stiff rails,—the efficient engineering structures,—must be sound, for any section to stand in the track without distortion under traffic. If the steel contains a central core of harder material than the outside, or is porous, containing occluded gases, then it does not have sufficient toughness and tenacity of structure for the requisite limits of cubic elasticity to sustain the wheel load effects without distortion, and fails mechanically as an engineering structure.

A NEW NILES UNIVERSAL RADIAL DRILLING MACHINE.

The Niles Tool Works, Hamilton, O., has brought out a new 6-ft. universal radial drilling machine. The drill head saddle fits between as well as outside of the arm guides, which complete the double box section of the arm and insure great rigidity. The column saddle is strongly gibbed to flat scraped bearings on the column and the post about which the column revolves extends to the extreme top of the sleeve. The use of large shafts, steel gears, bronze bushings and ring-oiling bronze bearings for all fast running shafts makes a strong durable machine capable of standing the hardest service. The principal features, however, of this machine are its convenience and ease of manipulation. All the feeds and speeds are changed by means of levers, and great care has been taken to arrange the levers and hand wheels so that



NILES UNIVERSAL RADIAL DRILLING MACHINE.

they shall be within easy reach of the operator. The column rests on ball bearings.

The machine is adapted for use with either carbon or high speed drills, the range of spindle speeds being sufficient for this purpose. Friction clutches are used for starting and stopping the machine at high speeds, so as to prevent shock and consequent wear. The speed box is planed on the top, in order that the drill may be easily changed from a belt driven machine to a motor driven machine, by the simple substitution of two gears for the pulley. Reversing gears for tapping are provided. All speeds and feeds may be changed while the machine is running even at its highest speeds.

This radial drill is a full universal machine, that is, both the arm and the saddle swivel. The principal dimensions of the machine are as follows:

Drills to the center of	12 ft.
Maximum distance from face of column to center of drill	77½ in.
Least distance from face of column to center of drill	22½ in.
Greatest distance from spindle to base plate	72 in.
Traverse of spindle	20 in.

NOVEL USE OF PAPER.

As Protection of Iron and Steel Structures—Eleven Years' Tests.

At the meeting of the American Society for Testing Materials, held at Atlantic City, N. J., June 29 to July 1, 1905, Mr. Louis H. Barker presented memoranda covering eleven years' tests on the protection of iron and steel structures. These tests were described as follows:

About eleven years ago experimental investigation was begun with numerous well-known and established iron paint-preservatives, in order to ascertain by actual exposure tests the best one to resist the destructive action on steel structures of sulphurous gases in the form of smoke combined with the moisture of steam, and since that time fifty or more paints and combinations have been tried.

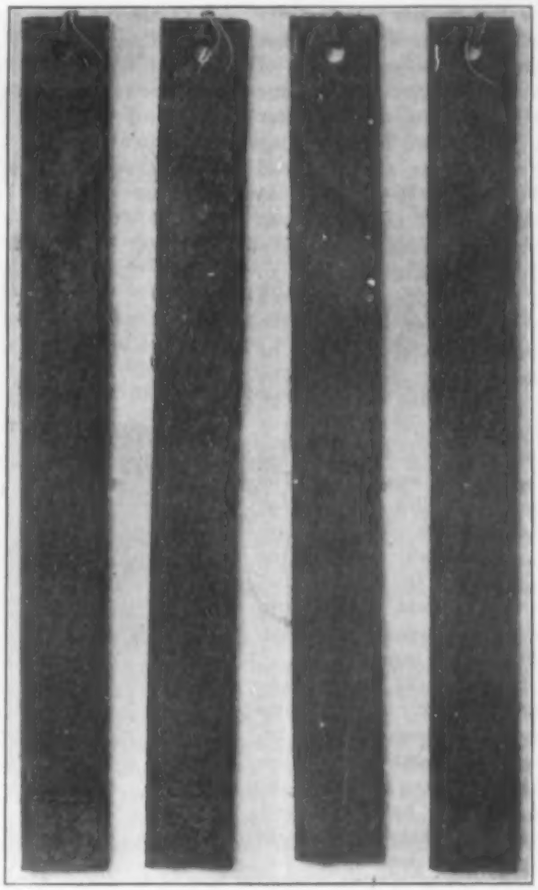
These included asphaltum, rubber, graphite, carbon lead and iron paints, and though the results showed varying degrees of resistance, it is remarkable that even with three coats of paint not one was found that did not show rust in less than a year. Of course, it is to be understood that the exposures were made so as to subject the test bars to the severest action possible in order to obtain the quickest results.

In making the first series of tests new steel plates 10 inches square were used. As, however, the adverse conditions we were trying to overcome related to rusty steel, which is more difficult to preserve than new steel, rusty plates were substituted in all tests thereafter. And to still further endeavor to meet the existing conditions new plates were hung up and exposed to the smoke fumes until they became covered with sulphur scale, the thought being that an oxide scale due to atmospheric exposure might give different results. This scale or rust formation on these new plates apparently varied not only in amount, but also in the time of its formation, supposedly due to different chemical composition. As this might again give some variations in the experimental results, in order that all paints should be on as like footing as possible, angle bars 11 feet long were made use of and as before hung in the smoke until rusted, then cleaned with wire brushes, each foot of the bar painted with a different paint and again hung up. The results, however, continued to be unsatisfactory.

In examinations of the test bars from time to time it was seen that upon many of them the paint was intact, but with protruding points which upon being pricked were found to be small rust formations pushing up the paint from behind, clearly indicating that it was not the failure of the paints but the rust action of the inner surface that caused the damage. As no rust can form without the presence of moisture, and as all paints are pervious to moisture (as Dr. Dudley's careful investigations of the subject have proved) this led to the conclusion that it would be necessary in some way to tightly seal the surface. Many kinds of materials for doing this were tried, with as many different results, until three years ago it was decided that a cheap paraffine paper answered the purpose best of all and since that time all experimentation has been along that line. The few test bars that have been brought along and exhibited indicate the results. Besides the experimental bars referred to, the paper covering has been tried in a small practical way against smoke action, and after two years and three months exposure an examination of very recent date shows the outer paint, the paper and the first or adhesive coat all intact and in many places where paper was removed for examination the adhesive coat not yet dry and the surface of steel the same as when painted.

With such satisfactory results from this paper-process in the smoke tests, it was concluded to make a large-scale application and severe test on a large number of I beams supporting a floor over and within a few feet of salt water and upon which the rust was due not to smoke but to the almost continuous dampness and presence of sewer gases. This was done over a year ago and up to this time indication of damage of no kind is apparent.

The mode of application of the paper is as follows: After the rust is carefully cleaned off by means of stiff wire brushes, a certain kind of tacky paint is applied, the paper then covered over and tightly pressed upon the painted surface, the joints of the paper slightly lapping. As soon as the paper is in place, it is ready for the outside coat of paint. It will be observed that by this process, the first coat of paint, the paper and the coat of paint over the paper can be applied with one scaffolding, thereby greatly reducing the cost, especially in high and dangerous places.



EXPERIMENTAL BARS EXPOSED EIGHT MONTHS—LOWER HALF PAPER, UPPER HALF PAINT, THREE COATS.

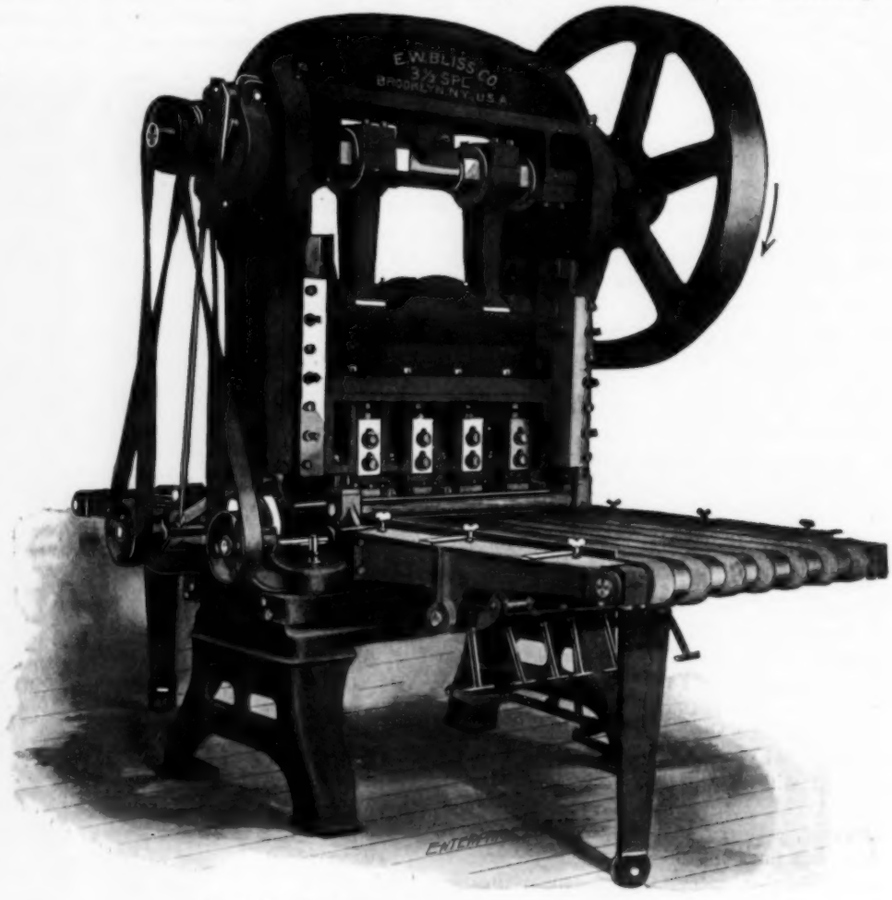
These experiments, extending over only three years, are of too short a duration to determine the value of paper as a protection for iron and steel, but they certainly bring out the fact, at least in the case of smoke and gases, that the action begins from behind the paint and not from in front by the disintegration of the paint.

Frederic Nicholls, vice president of the Dominion Iron & Steel Co., emphatically contradicts the recent statement of a contemplated deal for the absorption of that company by the United States Steel Corporation. No negotiations, he says, with any such object in view have taken place.

"BLISS" DOUBLE CRANK PRESS WITH SPECIAL FEED.

The E. W. Bliss Co., 8 Adams street, Brooklyn, N. Y., have brought out a press with an interesting feed, which is especially adapted for cardboard feeding, although it may be used for other purposes. This press is shown in the accompanying illustration. This feed consists of two pairs of rolls in front and back of the machine driven by belts connected with pulleys on the main shaft; and in addition to these rolls there is a belt feed as shown, used for carrying the stock up to and away from the gripping rolls. The tables over which the canvas belts move are so arranged that they may be swung out of the way to give the operator free access to the dies for the purpose of adjusting them. These tables extend about four feet both in front and back of the press and are wide enough to handle sheets of cardboard up to 40 inches. Gauges are fitted to the tables so that the narrower sheets may be used when desired. The press is also fitted with adjustable automatic stop fingers to hold the paper in place while being cut. The small handles underneath the press are used for tightening the belt. There is no adjustment in the pitmans, but the press is equipped with nine separately adjustable punch holders.

Some of the principal dimensions of this machine are as follows: width between uprights, 44 in.; distance between gibs, 38 in.; weight of balance wheel, 1,300 lb.; total weight of machine, 13,000 lb.



"BLISS" DOUBLE CRANK PRESS WITH SPECIAL FEED.

The press is very rapid in action and is controlled by the "Bliss" automatic positive clutch, which insures instant response to pressure on the treadle.

Andrew Carnegie's View of Labor.

In his new book "James Watt," Andrew Carnegie writes as follows:

"Writers upon labor, who have never labored, generally make the profound mistake of considering labor as one solid mass, when the truth is that it contains orders and degrees as distinct as those in aristocracy. The workman skilled beyond his fellows, who is called upon by his superintendent to undertake the difficult job in emergencies, ranks high, and probably enjoys an honorable title, a pet name conferred by his shopmates. Men measure each other as correctly in the workshop as in the profession, and each has his deserved rank. When the right man is promoted, they rally round him and enable him to perform wonders. When favoritism or poor judgment is shown, the reverse occurs, and there is apathy and dissatisfaction, leading to poor results and serious trouble. The manual worker is as proud of his work, and rightly so, as men are in other vocations. His life and thought center in the shop as those of members of Congress or Parliament center in the house; and triumph for him in the shop, his world, means exactly tne same to him, and appears not less important to himself and his family and friends than what leadership is to the public man, or in any of the professions. He has all their pride of profession and less vanity than most."

The Light of the Firefly.

Sir James Dewar in a recent lecture on "Flame" before the Royal Institution in London, presented some figures showing the energy expended in the production of light. It is interesting to note the high efficiency which is attributed to the Cuban firefly. The figures given are as follows:

	Percentage of Light	Non-Luminous Energy
Candle	2	98
Oil	2	98
Coal gas	2	98
Incandescent lamp	3	97
Arc lamp	10	90
Magnesium lamp	15	85
Cuban firefly	99	1

—[Electrical Review, New York.

THE PURIFICATION OF BLAST FURNACE GASES.

At the Mining and Metallurgical Congress, recently held at Liege, an interesting paper on the above subject was read by Emile Bian, of which the following is an abstract:

The use of blast-furnace gas dates back no further than 1837, and it is to Faber Du Faur that the idea of employing the gas for heating the blast was first due. Later, the gas was also used for raising steam in the boilers, a step which greatly increased the output of the blast furnace, and resulted in a large saving of fuel per ton of pig iron produced.

From this time forward progress has been rapid, and at the present time makes of 600 to 800 tons daily are common in America, while in France an output of 250 tons per furnace per 24 hours is easily effected with a coke consumption of 2,420 lb. to 2,640 lb. per ton of pig iron. The total annual production of pig iron averages 40 millions of tons, with a coke consumption of about 50 millions of tons, a figure which alone serves to emphasize the necessity of recovering the gases, as each ton of pig corresponds to a yield of 110,000 cubic ft. of gas.

Hitherto blast-furnace gases have been used without regard to the percentage of dust they contain, which in Luxemburg practice amounts, on an average, to 12 grains per cubic foot. The employment of gas engines, which on their introduction were supplied with ordinary illuminating or producer gas, but which are now fed with blast-furnace gases, has led to attention being directed to the elimination of the dust which these gases contain. In the early stages it was believed possible to employ blast-furnace gas without any purification, but this led to disastrous results, and the owners and engineers of large gas engines hastened to solve the question of purification, sparing neither trouble nor expense to extricate themselves from so awkward a position.

Thus a multitude of cleaning systems sprang into being, giving results sufficiently good to solve the situation, yet not economical enough to endure for any length of time. From this period may be said to have set in an era in the pig iron industry that might be described as that of experiments on the cleaning of blast-furnace gases. This does not affect the fact that prior to this epoch attempts had been made to clean blast-furnace gases with the object of improving their use in heating Cowper stoves and boilers.

The usual systems employed consisted of sending the gases through one or more vertical pipes, in which, during their passage, the direction or velocity of the gases underwent change. In 1876 Belani advocated a wet cleaning process based on the principle of increasing the specific weight of the dust particles disseminated throughout the gas, and causing them to become deposited. To achieve this object Belani used steam, but the method was not applied commercially. In 1884 Fritz W. Lurmann drew attention to the importance of having a perfectly cleaned gas, and in 1897 Dr. Hahn suggested a purification process carried out in three stages. In the first stage the gas was subject to the action of jets of water from Körting injectors, in a large chamber; the gases, on emerging, were saturated with water vapor. In the second stage an enormous horizontal condenser 66 ft. long by 15 ft. high by 3¼ ft. in depth was employed. This condenser was filled with perforated tubes, which allowed of the injection of water under pressure. The third stage was carried out in a water separator, or dryer, a circular reservoir 9¾ ft. in diameter and 13 ft. high. This method is certainly based upon rational principles, but is too costly and too complicated, besides which the fine dust is not eliminated. Thus at the Georgsmarienhutte, near Osnabrucken, where a wet cleaning system had been installed, the gas still retained two grains of dust per cubic foot, with a water consumption of 7,000 to 8,000 cubic ft. of water per hour for 705,000 cubic ft. of gas, i. e., 18 lb. to 20 lb. of water per cubic yard. Other German works experienced the same lack of success; the lowest limit of purification was, with all these systems, still too high, and the consumption of water too great. Trials were next made of the cleaners used in illuminating gas works, coke and other scrubbers being used. Plants on this principle were installed at the Friedenshutte, in Upper Silesia (the first works to install gas engines), and Dudelingen and Differdingen followed suit shortly on a larger scale.

It goes without saying that, for very large volumes of gases, all these systems are impracticable. An estimate made in "Stahl und Eisen" places the cost of an installation for a 200-ton furnace producing 1,400,000 cubic ft. of gas per hour, at £28,000. Such appliances can only be used for relatively small volumes of gas required for use in engines.

Theisen, believing that mechanical means were required, and that it was necessary to agitate the gases violently, designed his centrifugal purifier. This apparatus gave good results, but took too much power to drive it, and several works which made trials of it soon abandoned it. The first Theisen purifier was installed at Horde in October, 1900, and reduced the dust from 40 grains per cubic yard to one grain.

At this period it was accidentally discovered that an ordinary fan with water injected at the inlets yielded excellent results. There had been installed at Dudelingen a small fan to help the passage of the gas through the various tubes, scrubbers, and filters. After three weeks' running it was found choked with fine dust. The idea occurred of injecting water to obviate the deposition of the fine dust; it was then observed that by this means the degree of purification had been greatly improved. The fan purifier had been discovered.

Without going into particulars of the various systems of purifiers, the rational principles underlying the problem may be indicated. It had quickly been seen that cleaning the gas for use in engines would be too costly, and that, seeing the great advantages attending the use of purified gas for the Cowper stoves and the boilers; it would be necessary to purify the whole of the gases produced by the furnaces. Several works therefore installed fans with water injection at the foot of the furnaces, and behind the dry washers, but without success. The gases issuing from the throat had a very high temperature, and, being brought into contact with the wash water of the ventilator, a partial evaporation of the water took place, and the gas became so saturated with water vapor as to burn badly, or not at all, in the Cowper stoves and at the boilers. To avoid this, a second fan was placed after the first. A great improvement resulted, but the power required became unduly large. Incidentally, however, this served to demonstrate the immense importance of cleaning the gases used in the Cowper stoves and beneath the boilers.

Take, for example, a blast furnace producing 100 tons of pig iron per 24 hours, with four Cowper stoves and six boilers. Each stove requires cleaning four times a year, say 16 cleanings. Each cleaning lasts eight days, or 128 days in all. Now practice shows that during the period of cleaning 154 lb. more coke are required per ton of iron made. $154 \times 100 \times 128 =$ about 900 tons at 22s. 6d. per ton = £1,012, to which must be added the cost (£30) of the 16 cleanings. Now with purified gas

only one cleaning per annum is required, and the saving is very considerable, besides which the stoves, etc., last longer. At the same time, the calorific value of the purified gas being about 150 calories higher, the temperature of the stoves is increased. Suppose the temperature to be raised 10 degrees C., practice shows that an average economy of 44 lb. of coke per ton of pig iron is effected for each increase of 100 degrees C. in blast temperature; this gives us, for 100 tons, 4,400 lb., and per year 4,400 × 360 = nearly 700 tons, at, say, 24s. per ton = £840 per annum.

Altogether it may be shown that the direct saving in a furnace of this output by the use of purified gases will amount to about £1,600 per annum.

What is the best method of effecting the purification? The fundamental idea to be followed is that of effecting two cleanings, i. e., to clean the whole of the gas to a degree sufficient to prevent the dust from being injurious in the Cowper stoves—a limit of about six grains per cubic yard—and to purify the gas intended for use in the engines to a maximum of 0.6 to 0.2 grains per cubic yard. In order to do this the following considerations must be borne in mind: The gases escaping from the throat of a blast furnace consist of carbon dioxide, carbon monoxide, nitrogen, hydrogen, hydrocarbons, a large proportion of water vapor, and, on an average, 100 grains of dust per cubic yard, with a temperature ranging from 80 degrees C. to 200 degrees, or even higher. It is this high temperature which renders purification difficult, inasmuch as the intimate contact of the high-temperature gas with water, particularly when the volume of the latter is small, favors evaporation, and the gases, already moist, are largely saturated with water vapor. Hence, it seems clear that the purification of gas can only be effected in one way—by the elimination, as completely as possible, of water vapor.

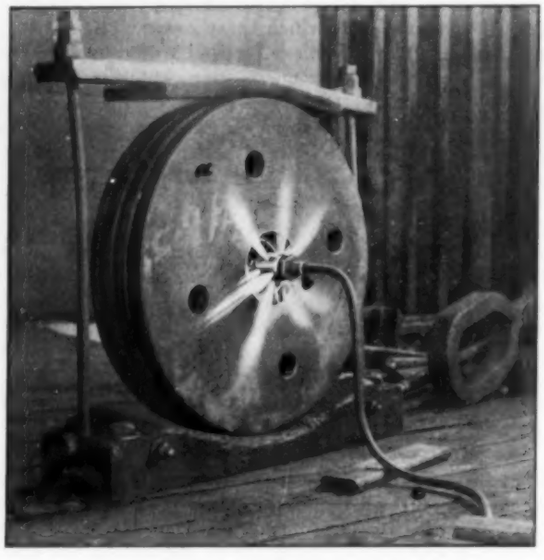
It would, indeed, be possible to go further than this, and to say that if by any means it was possible to completely eliminate the water vapor from a gas, the gas would be absolutely pure, on condition, of course, that together with this water elimination, contact bodies in motion were placed in the condensing chamber.

The process adopted consists of cooling the gases as thoroughly as can be done without having recourse to a refrigerator. The apparatus consists, essentially, of a metallic chamber, within which revolves a horizontal shaft furnished with a series of vertical discs, in the form of a metallic screen or grating, which plunge, to the extent of half their diameter, into water. The latter is renewed constantly. The gases which enter at a high temperature are at once brought into contact with a coarse metallic grating presenting numerous small films of water. These are immediately evaporated; the gas becomes cooled and charged with water vapor. During the continuation of its passage through the apparatus the gas becomes cooler and cooler, until it is no longer hot enough to evaporate the films of water, whereupon the latter play the part of condensers, the water vapor in the gas is condensed in contact with the cold metallic surfaces, and the fine water-laden particles of dust are precipitated. The gas is then in perfect condition for purification by centrifugalization; it is cold, and already deprived of the bulk of its impurities. It is also enriched by the solution of the inert CO_2 in the water, while the great bulk of the water vapor has been deposited on cooling, for whereas gas at 150 degrees can hold approximately 4¾ lb. of water vapor, when cooled to 29 degrees it can only retain about ¾ oz. This is one of the chief reasons why the hot gases cannot be passed direct into a centrifugal fan. In this case the gas leaves still saturated with water vapor, the motive power for the fan increases, and it is exceedingly difficult to get the gases to burn. In the other the gas undergoes a contraction of $\frac{1}{273}$ of its bulk for each degree it is cooled, so that for a diminution of 100 degrees its bulk becomes only about 1-3, which is a great advantage when used in gas engines.

The advantages of the apparatus are as follows:—(1) It is possible to cool and purify the whole of the gas produced in the furnace. (2) The apparatus is simple and strong. (3) The expenses of maintenance are insignificant. (4) Little driving power is required. (5) Little water is used, and this may be of any quality, even dirty water being permissible. (6) The gas is cooled, whatever its initial temperature may be, to the neighborhood of that of the water, cooling from 185 degrees to 30 degrees C. having been effected in practice.—[Mechanical Engineer, London.

A USEFUL HEATING DEVICE.

For shrinking locomotive pistons on the piston rods the heating device shown in the acompanying illustration will be found useful. The piston is placed in a clamp as shown and a gas burner introduced, which is provided with a number of openings from which the gas flames burn, as shown. A mixer is located at B and the gas and air regulated with it, and burn with a blue flame like a Bunsen burner. After the piston has been heated



A USEFUL HEATING DEVICE.

sufficiently to expand it the required amount, the clamp is dropped over on its side and the piston lowered into place by a special clamp suspended from a hoist. When the piston rod comes down to its shoulder the nut on the back side is tightened and the cooling of the cast iron piston causes it to shrink upon the piston rod, making a very secure fit. In the accompanying illustration the hole in the piston is 3½ in. in diameter. The burner is provided with 15 holes, and uses illuminating gas.

The aftermath of the Lake Shore wreck at Mentor, O., includes the notice of the payment of the accident insurance policies of Thos. R. Morgan and Chas. H. Wellman, victims of the accident. The estate of each was paid $48,000. James R. Phillips, district manager, The American Sheet & Tin Plate Co., who was killed in another railroad wreck, carried $23,000 insurance.

NEWS FROM MANY INDUSTRIES.

New Buyers :—

The International Machine Co., Adrian, Mich., intends spending $3,500 on new machinery to be devoted to the manufacture of fence looms.

The Wheeling Mold & Foundry Co., Wheeling, W. Va., is in the market for a small electric traveling crane, from two to five tons capacity, 30 to 40 ft. span and 15 to 20 ft. hoist, with direct current motors of 220 volts.

The Davidson-Namack Foundry Co., Ballston Spa, N. Y., contemplates erecting an addition to its molding room, and will probably be in the market for a blower and tumbling barrel.

The Niagara River Mfg. Co., recently incorporated at Niagara Falls, N. Y., will soon let the contract for the erection of its plant and the equipment of same for the manufacture of wood pulp.

The Axelsen Machine Co., Los Angeles, Cal., will probably be in the market in the near future for considerable equipment of machinery tools suitable for the manufacture of gas engines for stationary, marine and automobile purposes.

The McGovern Mfg. Co., 322 Market street, Camden, N. J., has been incorporated with a capital stock of $180,000 to manufacture grates, grate bars, and any form of iron and steel. The incorporators are: Paul Reilly and William Nuneville, both of Philadelphia, and William S. Darnell, of Camden.

The Empire Supply Co., 15 Exchange Place, Jersey City, N. J., has been incorporated to manufacture railroad appliances. The incorporators are: Mingo J. Currie, George J. Fermier, and Albert I. Drayton, all of Jersey City.

The Landon-Wilder Machine Co., Chicago, has been incorporated with a capital of $200,000. The incorporators are: B. S. Landon, Frederick G. Frankenberg, and J. H. Wilder. The concern will manufacture tobacco machinery.

The American Steel & Tube Co., Chicago, has been incorporated with a capital of $100,000. The incorporators are: A. W. Underwood, N. S. Smyser and J. A. McKeown.

The Toledo Iron Castings Co., Toledo, O., has been incorporated by Ben Gomerrall, R. P. Latham, C. W. Bond, H. H. Tolerton, and G. L. Shanks. The capital stock is $25,000.

The Wilkins-Challoner Co., Oshkosh, Wis., has been incorporated to manufacture machinery. The incorporators are: Theodore S. Wilkins, John Challoner and Chas. W. Radford. The capital stock is $100,000.

The Bain, Law & Ball Foundry Co., New York City, has been incorporated to manufacture brass, iron and steel products. The capital is $15,000. The incorporators are: Duncan Bain, 3278 Hull avenue, The Bronx; Albert Law, 282 Tomkins avenue, Brooklyn; William H. Ball, Spuyten Duyvil, New York; Anna A. Bryne and John C. Giesler, both of 55 Liberty street, New York.

The Union Iron Works, Houston, Texas, has been incorporated with a capital stock of $75,000, by B. J. Harper, George L. Woodard, Jas. Prinegan, R. U. Jeffry, and C. T. Will. The concern will manufacture machinery, iron goods, pumps, well supplies, etc.

The Richmond Pattern & Structural Iron Works, Richmond, Va., has been incorporated with $15,000 capital stock, to manufacture wooden and metal patterns, ornamental and structural iron work. W. R. Meredith is president; Reuben P. Liscomb, vice president, and Frederick Fitzgerald, secretary and treasurer.

The Marine Iron Works, Tottenville, N. Y., has been organized with a capital of $20,000 to manufacture engines, machinery, etc. The incorporators are: Jacob M. Fisher, 324 Main street, Tottenville, N. Y.; William S. Reid, 35 North First street, Perth Amboy, N. J.; Walter Rogers, Tottenville, N. Y., and J. A. Androveth, Kreisherville, N. Y.

Tuffli Bros. Pig Iron & Coke Co., St. Louis, has been incorporated by Chas. F. Tuffli, of Highland, Ill.; Richard Tuffli, E. G. Tuffli and W. Tell Tuffli.

The Cowles Engineering Corporation, New Haven, Conn., has been incorporated with a capital stock of $50,000, to repair engines by means of a new method which has been recently patented. Henry G. Newton is president; B. S. Cowles, vice president, and L. E. Pangburn, secretary and treasurer.

The Chandler Machine Co., Ayer, Mass., has been incorporated with a capital stock of $50,000. Chas. F. Edgarton is president, and Geo. J. Burns, treasurer.

The Acme Iron Co., Chicago, has been incorporated with a capital stock of $10,000. It will carry on a mining, manufacturing, smelting and contracting business. The incorporators are: Andrew J. Hirschl, Augustus C. J. Timm and T. Irving Christopher.

The Eagle Claw Wrench Co., Minneapolis, has been incorporated with a capital of $10,000. The incorporators are: R. Powell and E. A. Westerman, Minneapolis, and J. A. Schlehr, Frazee.

The Anderson Hardware & Furniture Co., Anderson, Texas, has been incorporated with a capital stock of $10,000. The incorporators are: W. S. Brown, J. T. Prestwood and Dudley Brown.

The Fargo Iron & Foundry Co., with a capital of $15,000, mentioned in the issue of July 13, should have been the Fargo Foundry Co., with a capital stock of $50,000.

The Ashland & Ironton Bridge Co., Ashland, Ky., has been incorporated with $1,500,000 capital stock, to build a bridge across the Ohio river, connecting Ashland with Ironton, O. The offices will be in Cincinnati.

The Panama Tank Co., New Orleans, La., has been incorporated with $25,000 capital stock, to manufacture iron and steel tanks, cisterns, etc. Crawford H. Ellis is president; John B. Honor, vice president; Horace Myrick, treasurer; Edwin T. Merrick, secretary, and Philip L. Tippetts, manager.

The Interstate Mfg. Co., Kansas City, Mo., has been incorporated to manufacture implements. The capital stock is $100,000. The incorporators are: John M. Wilson, R. B. Taliaferro, J. E. Markle and J. M. Wilson.

The Globe Boiler Compound Co., Binghamton, N. Y., has been incorporated to manufacture boiler cleaning compounds. The capital is $10,000, and the incorporators are: Hiram Mintz, Arthur L. Dickinson, and Edward F. Hoffman, all of Binghamton, N. Y.

The Fulton Machine & Vise Co., Lowville, N. Y., has been incorporated to manufacture vises, pumps, and paper making machinery. The incorporators are: Edwin W. Fulton and Mason M. Swan, both of Watertown, N. Y.; Lafayette Wetmore, Lowville, N. Y., and others. The capital is $30,000.

The Alger Macfarlane Co., incorporated in Massachusetts, will deal in steel, iron and metals. The capital is $15,000, and the officers are: Duncan Macfarlane Jr., treasurer, 3 Dunham street; Michael F. Culline, clerk, 408 Bowdoin street, both of Boston.

Fires:—

The plant of the Ireland & Matthews Mfg. Co., Detroit, Mich., manufacturers of sheet iron goods, was damaged by fire to the extent of $100,000 July 10. The plants of the Michigan Bolt & Nut Works and the Detroit Forging Co., which are located immediately adjoining, escaped with a severe scorching. The plant will be rebuilt, but 500 men and women will be thrown out of employment indefinitely, and the work of the Detroit Forging Co., to which the Ireland & Matthews Mfg. Co. furnished power, will be suspended temporarily.

The three-story building occupied by Rawson & Evans, sand blast furnace manufacturers, at Chicago, was burned July 14, entailing a loss of $15,000.

The foundry of the East Jordan Foundry & Machine Co., of East Jordan, Mich., was damaged by fire recently. Fortunately the fire was confined to the molding room, the pattern loft with its accumulation of patterns being saved.

The machinery shop of S. H. Seavel, Abilene, Texas, was burned recently causing a loss of about $7,000.

New Construction:—

The E. G. Wallof Machine Works, of Minneapolis, Minn., is having plans drawn for a new machine shop and factory building.

The McClintic-Marshall Construction Co., of Pittsburg, has been given the contract to erect a new steel building at Coatsville, for the Lukens Iron & Steel Co.

The Covington Machine Co., of Covington, Va., has awarded the contracts for the erection of a brick addition to its plant, which will be used as an erecting shop. No new machinery is required.

Architect J. T. Fortin has prepared plans for a foundry and pattern shop to be built at Canalport avenue and Johnson street, Chicago, Ill., for the Reder Foundry Co. The foundry will be one-story and 90 x 91½ ft. The pattern shop will be three stories and 76 x 103 ft. It is estimated that the two buildings will cost $40,000.

Work on the big steel plant of the Prescott Co., at Menominee, Mich., nas been started, contracts having been let for the mason and carpenter work.

The Geo. A. Ohl Co. has started work on the construction of its new foundry at Newark, N. J., which is to be 56 x 235 ft.

Plans are being prepared for a plant consisting of machine shop, foundry, pattern and pattern storage shop, and boiler house, to be erected at Elkins, W. Va., for the Humphrey Mfg. Co., Towanda, Pa., which has lately been incorporated under the laws of West Virginia, with a capital stock of $25,000.

A. M. Sweder, of the Lakeside Iron Works, Marquette, Mich., is planning a number of improvements in his foundry and machine shop. The foundry department has been idle for several months, on account of the fact that the building needed extensive repairs, including the rebuilding of a portion of it.

The old Emmons sludge mill near Joplin, Mo., which was recently destroyed by fire, will be rebuilt on entirely modern lines at a cost of $10,000, by C. W. Squires, of Joplin, and J. L. Moore and J. H. McGee, of Webb City. The new mill will require an entire line of equipment and will, doubtless, be in the market for a considerable quantity of machinery. One feature, the installation of a gas engine of 100 h. p., has already been decided upon.

A permit was issued by the city engineer of Houston, Texas, to the Peden Iron & Steel Co. for the building of a warehouse to cost $32,728.

The Ohio Cultivator Co., of Bellevue, O., is planning to build an addition to its plant, 80 x 250 ft., which will give it one of the largest and most complete foundries of the kind in the country.

The new building for the Newbury foundry, of Goshen, N. Y., is practically completed.

The car wheel foundry of the American Car & Foundry Co., of Berwick, Pa., is to be enlarged so as to give it a capacity of 540 freight car wheels per day.

The C. A. Burton Machine Co., Kansas City, Mo., has let the contract for the construction of its new building to Geo. L. Brown & Sons, contractors. The structure is to be completed by Sept. 1, and will be 75 x 108 ft. on the ground, three stories high and will cost $30,000.

The Baltimore Bridge Co., Baltimore, Md., will erect a one-story shop for Thomas C. Basshor & Co., in that city. The building will be 90 x 200 ft., with steel skeleton, corrugated steel sides, and will cost $11,000.

The King Stove Works, successor to the Lizzie Lowman Stove Foundry Co., of Sheffield, Ala., has purchased ground adjoining its plant to enlarge the foundry and double its present capacity.

The Cleveland City Forge Co., Cleveland, is adding a one-story brick warehouse to its turnbuckle department

The New Way Motor Co., Lansing, Mich., is erecting a modern factory building. The company manufactures a stationary air cooled gasoline engine in two styles, a single cylinder vertical of from 3 to 3½ h. p. and a two-cylinder opposed engine of 6 to 7 h. p.

The Van Dorn Iron Works Co., Cleveland, is erecting a large factory building at its works on East Madison avenue. It will be 120 ft. x 280 ft. on the ground, and will be of brick and steel construction.

A steel bridge will be erected over Sangamon river south of Decatur, Ill., at a cost of $15,000. G. V. Loring is the city engineer.

The Southwest Missouri Electric Railroad, Kansas City, Mo., will build 2,220 ft. of steel and concrete bridges along its new fifteen mile extension.

The Columbiana Foundry Co., Columbiana, O., will erect a foundry building in the near future. The plans have been prepared by Architects Searles, Hirsh & Gavin, 308 Electric building, Cleveland, and are now being figured on. The building will be 100 x 100 ft., of brick construction, with steel trusses, and will cost $2,500.

The Hays-Henderson Saw & Supply Co., Chattanooga, Tenn., will build a two-story building 40 x 100 ft. on property already owned by them. The building is to be built of brick and corrugated steel, and the building material will be bought at Chattanooga. New machinery is to be purchased.

The Lombard Iron Works & Supply Co., Augusta, Ga., has awarded the contract for an extension to its foundry and boiler shop which is to be a steel building with a crane runway 46 ft. span and 322 ft. long. The contract for a pneumatic or electric crane 46 ft. center to center rail will be placed before Sept. 1. The company will also want one 15 or 20-ton hoist, with operator's carriage, etc.

The Transue & Williams Co., Alliance, O., is making a number of improvements in its plant, to meet the growing demand for steel forging specialties. The work includes an addition to the die and machine shop, 100 x 50 ft., a fireproof vault for dies and patterns and a number of steam hammers to be added to the forge department.

The Sullivan Machinery Co., Railway Exchange, Chicago, is erecting a $200,000 addition to its eastern works at Claremont, N. H. F. M. Garthwait, 138 Washington street, Chicago, is the contractor, and A. S. Coffin, 109 Randolph street, is the architect.

The Colonial Foundry & Machinery Co., South Norwalk, Conn., has recently completed two new additions to its plant. The moulding room has been enlarged from 90 by 70 feet to 90 by 150, and a new cleaning and grinding

room about 65 ft. square has been built. The old cleaning room is now used for storage purposes. Two 12 by 14 core ovens have been added and also a toliet room for the moulders equipped with shower bath and lockers. The business has grown rapidly during the past two years, the plant now having a capacity of 30 tons per day, the iron being melted in two cupolas. The entire plant is operated by electricity furnished by a municipal power plant, which is said to furnish power for much less than it would cost to operate with steam.

The Johnson Boiler & Machine Co., Joplin, Mo., which has just been incorporated, will hold a meeting Aug. 15 to consider plans for enlarging its shops and store rooms and to make a selection of machinery for the equipment of its plant to handle mining machinery.

J. G. Schmidt, owner of the Lodi Artistic Wrought Iron Works at Lodi, N. J., has purchased a plot of ground in Passaic, where he will build a new shop, using the tools in his present shop for equipment.

General Industrial Notes:—

The wheel foundry plant of the American Car & Foundry Co., at St. Charles, Mo., has resumed operations after a period of idleness, during which a number of improvements have been made.

The Canadian Westinghouse Co. has prepared plans for doubling the size of its foundry building at Hamilton, Ont.

The Fort Payne Stove & Foundry Co., of Fort Payne, Ala., is now composed of J. B. Haralson, W. C. D. Cook, J. G. Mickler, S. B. Slone and T. J. Cook. The capital stock is $9,000. The first run since the rebuilding of the plant was made in July, and was very successful.

Jeter, Turner & Co., of Jonesboro, Ark., filed a resolution changing its name to the Jeter Hardware Co. W. J. Jeter is president of the concern.

The contract for the steel to be used in the construction of the new building to be erected by the American Express Co. in Trinity Place, New York, has been secured by the American Bridge Co. The contract calls for 7,000 tons of steel.

The plant of the Rochester Bridge Co., abandoned when that company was absorbed by the steel corporation, has been purchased recently by C. H. Palmer, a banker of Rochester, N. Y.

The Lorraine Foundry Co., Baltimore, Md., has asked for a receiver to wind up the affairs of the company, which ceased operations several months ago. The company is insolvent and is indebted to the Sloss-Sheffield Steel & Iron Co., to the extent of $1,882.49. The receivers are W. R. Townsend and W. S. Symington Jr.

The Knoxville Iron Co., Knoxville, Tenn., has filed a bill in chancery court against the Crucible Steel & Iron Works, of Philadelphia, asking for an injunction to restrain the latter company from securing its employees and thus interfering with the business of the plaintiff.

In a circular letter to its patrons the Schneck Machine Co., Milwaukee, calls attention to the change of the firm name from Chas. W. Schneck Bros. & Co., as it was formerly, to Schneck Machine Co. Confusion in receiving mail was the cause for the change.

The Crucible Steel Casting Co., of Lansdowne, Pa., announces that after July 15 it will be ready to make prompt deliveries on orders for crucible steel castings. It is also prepared to quote special steel mixtures, such as nickel, chrome, tungsten, manganese, etc.

Rhodes, Curry & Co., of Amherst, N. S., has purchased the plant of the Sydney Mfg. Co. and the franchises of the company to manufacture steel cars. The plant will be considerably enlarged.

The Michigan Iron Co.'s furnace at Manistique, Mich., has been shut down for repairs. The plant will resume the manufacture of pig iron this week.

Recent reports as to the making of a record by the Illinois Steel Co. in June have elicited from the company the information that the best record was in May, when its Bessemer works produced 91,924 tons of ingots and the rail mill 71,724 tons of rails.

The Kemp Mfg. Co., Waterloo, Iowa, loaded three cars of machinery for Minneapolis last week, which is considered a large order during the dull season.

The Clyde Iron Works and the National Iron Co., Duluth, Minn., are involved in litigation to the amount of $100,000 over an alleged infringement of letters patent.

The contract for the American Savings & Trust Co.'s bank building, Chicago, requiring 2,700 tons of steel, has been let.

The Keefer Mold Works, at Alexandria, Ind., has been completed, and the moving of the machinery from the old plant at Gas City is now in progress.

Jack Marsden and John Schulz, both of Bessemer, Colo., have bought a foundry at Canon City, Colo., which they expect to put in operation at once.

The Western Tube Co., Kewanee, Ill., recently held its semi-annual conference of sales agents at the company's offices. These meetings are quite informal, but result in a great deal of good in as much as the agents acquire through them a comprehensive knowledge of the company's trade throughout the country.

Referring to the notice published in our last issue relative to the Morgan Spring Co., Worcester, Mass., it has been since learned from that company that it intends to install a Morgan type of continuous rod rolling mill at the plant of the Youngstown Bolt Co., which it has just purchased.

The Canadian Pacific railway has just purchased four large steam shovels of the Locomotive & Machine Co., of Montreal, Ltd. This order is the first of its kind to be placed in Canada, all steam shovels having been purchased heretofore in the United States.

As guests of the steel corporation and in charge of Geo. D. Kirkham, sales agent for the American Steel & Wire Co., Memphis, Tenn., a party of Wholesale Hardware & Grocery Jobbers' Association members spent July 16 in and about Duluth. They are on a trip to inspect the iron fields of Minnesota.

The American Cast Iron Pipe Co., E. E. Linthicum general manager, intends erecting as soon as possible a pipe plant in the Birmingham district which will cost in the neighborhood of $225,000. The company has been organized but recently, and will manufacture gas and water pipe, the plant to have a capacity of 150 tons of pipe per day.

The Midvale Steel Co., Midvale, Pa., has shipped to the Indian Head proving grounds a trial plate of armor which is to serve as the test piece for the February contract of 1,000 tons.

At a recent meeting of the directors of the National Cast Iron Co. the following officers were elected: President, Homer T. Chase, Pittsburg; vice president, Ira C. Ewing, Pittsburg; secretary, Lyman S. Alles, Pittsburg; and treasurer, C. M. Hine, Avonmore, Pa. The business of the company, which has grown very rapidly of late, pertains to the manufacture of fastenings for holding rails to steel ties.

Traveling agents and representatives of the American Steel & Wire Co. from all over the world, were entertained by the company at Chicago this week. The entertainment consisted, besides receptions and dinners, of various trips about Chicago and vicinity and ended with a banquet at the White City College Inn.

The rushed condition in which the big steel companies

find themselves is evidenced by the delay of the new cruiser St. Louis. The steel required for the armor plate of this vessel is being furnished by the Carnegie and Bethlehem companies.

The Porter Bros., Spokane, Wash., have been awarded the contract for the erection of seven bridges to cost between $300,000 and $400,000.

The Green & Sons Co., Appleton, Wis., has secured the contract for two triplex power pumps of 500,000 and 750,000 gallons capacity for the water works of Manistique, Mich.

Christened "Florence" by Miss Florence MacKay, the new eight in. tandem mill of the Carnegie Steel Co., at Greenville, Pa., was started July 14.

The old Harlan & Hollingsworth foundry, Wilmington, Del., has been sold to the P., B. & W. Railroad Co., for $70,000. The foundry has not been in use for several years and the property will now be used for sidings.

The Acme Iron Bed Mfg. Co., recently incorporated, is to broaden its field, and will purchase machinery enabling it to make iron springs, iron couches and mattresses. Its address is St. Anthony Park, St. Paul, Minn.

Among the American engineering concerns which have contracts for construction in England, is the J. G. White Co., New York, which is building for the International Navigation Co., and the Ritz Hotel Co. That the work of American engineers is giving entire satisfaction is evidenced by the increased amount of business this company is receiving.

C. H. Booth, successor to the Steel Bath Mfg. Co., Detroit, will be in the market early in the fall with a new line of that product turned out by facilities newly installed, which will add greatly to the economy of production.

The Parkersburg Iron & Steel Co., Parkersburg, W. Va., resumed operations Monday, July 17, and is now working to the fullest capacity with considerable business ahead.

The Maryland Steel Co., Sparrows Point, Md., has placed an order with British works for 20,000 tons of East Coast hematite to be used in the execution of a South American railway order. The order was split between "Newport" and "Jarrow" iron. Part of the iron has already been shipped and another vessel has been chartered to carry 4,500 tons from the Palmer yard at Jarrow, Durhamshire.

Under the personal direction of J. W. Duntley, president of the Chicago Pneumatic Tool Co., who but recently returned from Europe, that company has purchased the factory and business of E. G. Eckstein, Berlin, Germany, and that of the Lencke Co., St. Petersburg. The increase in its foreign business has made it necessary to better the organization of the company's interests abroad, and the recent purchases were made with that end in view.

The Newark Iron & Steel plant, Newark, O., offered for sale July 22 by Receiver Miller, found no buyer at the figure $18,185, which is two-thirds of the appraised value, and the sale will be again advertised.

The Gale Mfg. Co. and the Albion Malleable Iron Co., both of Albion, Mich., have been shut down only long enough to make needed repairs because the press of business necessitates the immediate resumption of operations.

The Pilling Air Engine Co., Detroit, has increased its capital stock from $20,000 to $35,000. The officers are to remain the same with the exception of Jas. L. Pilling, who, while retaining his present office as vice president, will also become the sales manager. C. L. Grimes, formerly with the Davenport Locomotive Works, Davenport, Iowa, has been elected director and secretary and manager of the company. The company is erecting a building in which it will install modern tools for the manufacture of its various styles of air hoisting machinery. The new machinery and building will be ready for operation about Aug. 15.

The MacKinnon Mfg. Co., Bay City, Mich., has received contracts for the steel to be used in the construction of two new freight houses for the Pere Marquette and for the construction of one of the largest saw mill refuse burners ever built on the continent for the Davison Lumber Co., of Springfield, N. S. The burner is to be entirely of steel, 118 ft. high and 40 ft. in diameter.

The Iron Co. of America, Roanoke, Va., while it has not definitely decided as to the removal of its plant to Scottdale, Pa., will either sell or move to the above location.

The Kilborn & Bishop Co., manufacturer of drop forgings and forged hardware, at New Haven, Conn., has issued its catalogue No. 4, which shows a great variety of drop forged hardware, including expansion bits, pliers, sawsets, box openers, linemen's climbers, etc. The firm is equipped to produce drop forgings of all kinds, and furnishes forgings to model or drawing in any material desired.

The Low-Carter Hardware Co., Carter, Texas, has increased its capital stock from $60,000 to $120,000.

The Consolidated Rail & Steel Co., St. Louis, dealer in scrap iron and steel, old railway supplies, etc., reports uniformly good progress in its business. It has accumulated fully 1,000 tons of stock in addition to the orders it has filled. which amount to as much more. Two shears are in operation at its plant and the third one will be installed in the near future. One of the shears is the largest of its kind in St. Louis and accommodates 4 in. iron readily. Since receiving its charter $2,000 more has been paid up on its capital stock.

The Falls Hollow Stay-Bolt Co., Cuyahoga Falls, O., states that its hollow bars, made of soft steel, can be used to great advantage in many cases for hollow shafting. Some of these bars were recently exhibited at the Master Mechanics' Convention, Manhattan Beach, N. Y., together with pieces of whole and solid iron, bent flat on themselves, the samples being broken to show the fibre of the finished product. Samples of the raw material, which is a mixture of Swedish and native charcoal iron, were also exhibited.

In the consular reports of July 11, Consul Alfred K. Moe writes that there are boundless possibilities for a great mining industry in Ireland. Coal fields capable of yielding between 20,000,000 and 30,000,000 tons, which compare favorably with the best Welsh and Scotch product, are said to exist. Iron ore deposits of as rich a quality as can be found in the United Kingdom are easily accessible to railroads.

Steel manufacturers who are constantly watching the crop reports will be interested in the estimate of the Canadian Pacific Railway which places the wheat yield of Canada at 125,000,000 bushels, a very favorable outlook.

The Neville Island furnace of the American Steel & Wire Co., located on Neville Island, below Pittsburg, was blown out last week. At this plant more than 10,000 tons of iron are carried in stock at present and the furnace will not resume until this is shipped.

The Southern Connellsville Coal & Coke Co., which recently acquired the property of the Riverview Coal & Coke Co., in the lower Connellsville region, has awarded a contract for the erection of 200 ovens. The headquarters of the company are in Pittsburg.